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CONTRIBUTIONS TO RHETORICAL THEORY

EDITED BY FRED NEWTON SCOTT, PH.D.

Professor of Rhetoric in the University of Michigan

VIII.

Pause; A Study of its Nature and its Rhythmical
Function in Verse, Especially
Blank Verse

By

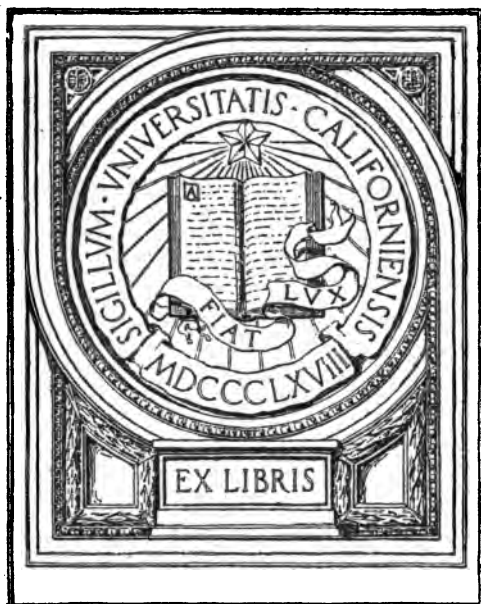
ADA L. F. SNELL.

A Dissertation Submitted in Partial Fulfillment of the Requirements for the
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ANN ARBOR
1918

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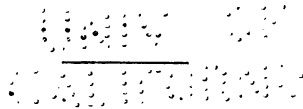
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S

INTRODUCTORY

The work which has been done on the subject of pause by writers of prosody has been on the whole incidental; and the results have been based either upon punctuation marks as a guide or upon personal preferences. Writers such as Bridges, in Milton's Prosody, and Schipper, in *Englische Metrik*, are chiefly concerned in their analysis of pause with its absence or presence at the end of the line and with its position with reference to the foot within the line. The work of the psychologists has been concerned not so much with pause as a language phenomenon or with the rhythmic grouping of syllables as with the investigation of the rhythmic instinct in general. The results of these investigations, in the first place, vary considerably, and in the second, may or may not hold true for language. References, for purposes of comparison, will be made to these investigations at different points in the discussion. The most detailed work known to me on the subject of pause is that of J. E. Wallace Wallin.¹ The material used for this investigation was poetry of a lyrical and formal character, poetry in which the line is a clear unit and in which the syllabic grouping follows a fairly well defined pattern. Wallin used Scripture's phonographic method, and depended for many of his results upon his ear. Some of his conclusions agree with mine; others necessarily vary, since blank verse of the freely enjambed sort differs in many particulars from more formally organized verse.

RECORDING APPARATUS, MATERIAL SELECTED, AND READERS

The results in this investigation are based upon speech records made with an apparatus such as is used in experimental phonetics. It was devised by Professor John F. Shepard, of the Department of Psychology in the University of Michigan. A brief description of the instrument appeared in the *Psychological Bulletin* for February 15, 1913. The following account is largely quoted from this article.

The apparatus was constructed as follows: first, the kymograph used in all the work was the complete Zimmermann pat-

¹ J. E. Wallace Wallin, *Researches in the Rhythm of Speech*, Studies from the Yale Psychological Laboratory, Vol. IX, 1901.

tern, with Hering slide and writing plane. An additional tin plate was attached to the top of the metal writing plane. This made possible the use of paper wider than the drums and the making of a record which received several tracings simultaneously. There is, next, a receiving instrument. In this are two chambers packed with cotton to prevent resonance, and having an opening which fits air-tight around the mouth and nose of the subject. The receiving chambers for the mouth and nose are separate. The escape from each chamber is regulated by a graduated opening. The nose and mouth chambers are connected by rubber tubes to tone recorders and to Marey tambours. The tambours record on a band of smoked paper the changing pressure of air in the chambers, produced by the outflow from the vocal organs. The recording instruments are carried on a universal tripod or stand-ard. For a time record a Jacquet chronograph was used, set to mark fifths of a second. Above the clock are placed in order, a mica tone recorder, a thin rubber tone recorder, and two Marey tambours covered with medium weight rubber dam. The mica tone recorder consists of a circular piece of mica about 43 mm in diameter placed over a shallow sound chamber and attached to a ring of rubber around the edge. A glass tube mounted on an adjustable carrier is connected to the bottom of the sound chamber. A small aluminum triangle is mounted on the centre of the mica disc and articulated with the recording needle. This needle is made of two pieces of quill about a millimeter wide, scraped thin, and glued end to end with the cross diameters at right angles to each other. With this arrangement the bending will be confined to the piece fastened in the holder, and the needle will move as a whole and not vibrate in sections. The rubber tone recorder consists simply of a glass tube, about 5 mm internal diameter, mounted on an adjustable carrier and having one end covered with very thin rubber. On the rubber is mounted a small aluminum triangle which communicates movements of the rubber to a recording needle like that used with the mica recorder. The mica tone recorder was used to write the sounds from the nose chamber; the rubber recorder wrote the tones from the mouth; and the Marey tambours recorded the pressure of the air in the mouth and nose chambers respectively. The accuracy of the instrument has been proved by converting the vibrations back again to sound.

Although the method of obtaining pause by means of the recording instrument described, yields precise and accurate results,

there are certain limitations involved which it is well to state. In the first place the conditions under which one speaks into a recording instrument are not perfectly normal, and may tend to produce results somewhat different from those of normal speech. But this is, on the whole, probably of slight importance; most readers declared that they quickly became accustomed to the instrument, and felt that they were reading as they naturally would. A second limitation arises from the fact that only a small amount of material can be investigated, and the reading of only a limited number of persons can be taken into consideration, since the time consumed in the making and reading of records forbids any great extension of the material. But if the variations in the results obtained from a few readers are not great, the probabilities are that an increased number of readers chosen from the same general class with reference to education and experience with poetry would not materially alter the results. In order to obtain a somewhat greater variety in this particular the readers were changed at various times, so that the reading of the one hundred lines of the *Paradise Lost*, although they were read but five times, was done by eleven persons. In the selection of readers, it did not seem necessary or profitable to include persons who had no liking for Milton's blank verse, or persons who do not read poetry well. On the other hand, it did not seem wise to select only trained readers; but the attempt was made to select persons who are accustomed to read poetry and who take a certain amount of pleasure in it. A short account of the persons who read the selections on which most of the results of this study are based is given at a later point. The reading in every case was done, not from memory, but from a typewritten copy of the material. The reader always read over the material once or as many times as he wished before speaking into the recording instrument.

The material selected for investigation was chosen after making an analysis of many passages with reference to enjambment, caesural pause, short and long phrases, and other qualities. The selected passages were taken as offering in small compass the various aspects of the problem to be considered. Other passages of the same length may be found which are more freely enjambed, contain fewer short sections, that is, fewer pauses, and would, therefore, yield slightly different averages; but an analysis of a thousand lines would probably not yield very different results.

In any case the results here given represent with a fair degree of accuracy what happened within the compass of one hundred lines spoken by eleven persons; and, limited as is the field, the results throw light upon some interesting language phenomena.

ANALYSIS OF TWO RECORDS.

To illustrate the records and the method of obtaining results two photographic copies were made of sections of two records. These appear at the opening of the volume. Before going into a detailed account of the reading of these plates it is necessary to define pause in the sense used in this investigation. Pause is a cessation of sound; but this cessation is of two sorts,—a cessation of sound with the vocal organs in motion and a cessation with these organs at rest. The first sort occurs when the vocal organs are in certain positions for the production of certain sounds, as, for example, for the production of the sound of *t*. The silence preceding the explosion characteristic of *t* may be of longer or shorter duration according to the rate of speaking. In this case, although there is silence, the flow of speech is uninterrupted, and the muscles of the vocal organs are in constant motion. The second sort of pause is made with the vocal organs at rest. It is with pause of this sort that we are concerned in this investigation. It is obvious that it may be difficult at times to determine how much of a given pause is rest pause. This happens when the two fall together and approximate each other in length. It is also possible that the ear may sometimes accept the one for the other. The method adopted in solving doubtful cases is explained in the detailed account of the reading of the plates given below.

The first plate is a record of the lines "Break, break, break, On thy cold grey stones, O sea." The second is a record of "Sing a song of sixpence, A pocket full of rye." Professor Shepard read the selections.

Before making a record, the recording pointers, which are arranged as nearly as possible along a plumb line, are made to strike arcs; these serve as lines of reference. The arcs and points of starting are indicated on the plate as follows: 1 represents the arc made by the pointer recording the outflow of the air through the nose; 2 represents the one made by the pointer recording the air coming through the mouth; 3 and 4 represent the beginning of the lines made by the pointers recording respec-

tively the nose and mouth tones; 5 is the time line. Corresponding points were found as follows: I cut from a record, made in a similar way to the one under consideration a pattern of the arcs and points, following the outlines precisely; this I pasted on a piece of heavy cardboard which was squared up along the time line. The cardboard could then be moved along the time line, and the corresponding points marked, as 1', 2', 3', 4', 5', indicated on the plate.

The first pause in the line "Break, break, break" was found by moving the cardboard described above along the lines until the beginning of the first group of vibrations was found on line 4, and the corresponding points on the other lines were then marked with a needle. The card was again moved until the top of the point marked K on the plate was reached, and the corresponding points again were marked. The point K represents the limit of the explosion for the sound of k, and the corresponding points indicate the end of the word break. Since a pause might occur between this word and the following, the question is, Where does the next word begin? The formation of the b would in continuous discourse begin approximately with the explosion of the k sound, and would be indicated on the record by a direct fall of line 2 to the lowest level. At this point, however, the line falls part way and then curves outward before falling again. From the beginning of the first fall to the end of the second, less the brief time of such a direct fall, is taken as a pause. To make a point of this sort more certain, the reader, when other records by the same reader afforded no similar combinations of sounds, was asked to speak these words continuously at about the same rate as for the original line. For instance, Professor Shepard spoke the sentence, "Break bricks for me," slowly as for the line of poetry. The record showed for the k between break and bricks a direct fall of line 2; and the time for the b was .2 of a second. Measuring off .2 on the time line backward from the second group of vibrations on line 3 brought the point for the beginning of the b almost at the second fall of the line, at the point marked B on the plate, and exactly so for the second b, marked B'. I used this time, .2, to find the point of the commencement of the first word in the poem. Since, of course, the rate varies with the same speaker for any given sound, it is not possible to find these points of beginning for unvoiced sounds with great precision, but with such precautions as are described above the error

would obviously be so slight that it could not affect the validity of the general results.

Having found by the above method the limit of the k sound and the beginning of the process for the formation of b, the space between was taken as a pause. This and other pauses on the plate are marked x. The third x represents the pause at the end of the first line.

The voiced sounds are represented by the groups of vibrations in lines 3 and 4. The negative spaces represent either unvoiced sounds or pauses. The voiced sounds coming through the nose are represented by vibrations in line 3. Thus at point 6 on the plate is the group of vibrations representing the sound of n, in stones. The n is further represented by the rise of line 1, at the corresponding point above; this line represents the outflow of the air through the nose. The beginning of the n is furthermore indicated by the change in the shape, "damping," of the vibrations in line 4.

Thus with the aid of the five lines representing the movement of different vocal organs concerned in speech production the position of the different words can be found. From the analysis already given of break, the other two words in the first line and the pauses will be clear. I will now give a more detailed account of the reading of the second line. Since the line opens with a voiced sound, o of on, the line will begin with the group of vibrations on line 4 following the third x, at the place marked O. 1', 2', 3', 4', mark the end of o. The group of vibrations on line 3, following the point 3, marks the n of on. The extent of thy is indicated by the group of vibrations beneath the word thy written on the plate; the th of thy is further indicated by the change in form of line 2. The c of cold is indicated by the negative space following thy and is also indicated by the rise of line 2 to the point marked C which represents the explosion of this sound. The vibrations following on line 4 are those of the voiced sound ol. The d is situated for the voice line at the close of this group of vibrations, indicated by D on the plate, and is also indicated on line 2 by the bend in the line. The beginning of g in grey is approximately the center of the bend in line 2 marked G. The fall of the line just preceding the point G represents the closure after the explosion of the d sound. The word grey ends with the end of the group of vibrations in line 4 following the G. The st of stones in line 4 lies between the two voiced sounds of e

in grey and on in stones. The end of stones is at the beginning of the group of vibrations marked O' which is the O of O sea. The final s of stones is also indicated by the high point marked S on the plate. The word sea must necessarily begin with the end of the group of vibrations marked O' and must end, since the word ends with a voiced sound, with the close of the last group of vibrations.

The second plate is a reproduction of the lines "Sing a song of sixpence, A pocket full of rye." This record was evaluated in the same manner as the one just described. The lines marked 1 and 2 represent respectively the lines made by the pointers recording the pressure of the air coming through the nose and mouth; the lines marked 3 and 4 represent the vibrations of the vocal cords transmitted through the nose and mouth respectively; 5 is the time line. The rise in the lines 1 and 2, as well as the length of the s in other positions, determines the beginning of the flow of air or sound. The points marked 1', 2', 3', 4', indicate corresponding points and also the outflow of air through the mouth after the closure of ng. The sound nga is represented by the space marked off on line 4, after 4' and by the space on line 2 between 2' and a. The end of the s sound in song is shown on line 2 by the point marked S, and the extent of the sound is the space between the two points on line 4, also marked S. Of, or o', is easily found, since, so far as the mouth record is concerned, it stands between two voiced sounds. The s and p of sixpence are indicated in line 2 by S' and P respectively. The extent of the sound of p alone, marked P on the plate, is indicated on line 3. The end of x in sixpence is the top of the elevation lying between the points S' and P. The beginning of the next line opens with the voiced sound of a, not distinctly spoken, as the faintness of the vibrations indicates. The space for a is marked off on lines 3 and 4 and is indicated by A. This a is in reality combined with the explosion of the preceding c (ts), as is indicated by the rise of line 2 to point A. The ends of p and k in pocket are marked on line 2 by the numerals 6 and 7 respectively, and the end of f in full, combined with the preceding t is indicated by 8. The extent or length of these is evident on line 4. The end of full and the beginning of of are not clear, since the two sounds blend. It is noticed, however, that beyond the point marked 8 on line 2 the shape of the line changes slightly. On line 4 at the corresponding point the shape of the wave also changes slightly. These changes probably indicate the beginning of of pronounced o'.

The length of of between song and six is a further aid; and the length of this of is almost exactly the length of the second of found by the method indicated. The beginning of rye is clearly seen by the rise of line 2 and by the last group of vibrations in line 4. The close of the word is plainly indicated.

The records were made on bands of paper ten inches wide and about eight feet long. As the paper ascends on the kymograph in going around once, it was possible to rotate twice and three times without obscuring the record. The length of pauses at points of division was obtained by having the reader repeat the last line or two of the preceding record.

PURPOSE AND PLAN OF THE INVESTIGATION

The purpose of this investigation is to discover by a scientific method the nature of pause as it occurs in English verse, especially blank verse. Milton's blank verse was chosen as offering the most interesting phenomena. The first chapter of the thesis deals with logical conditions under which pause occurs, and other conditions, such as rate of utterance, rime, verse, and rhythm. The second chapter considers the characteristics of pause; its frequency of occurrence, its position, its length, and its connection with certain other phenomena. The third chapter treats of the function of pause in poetry, namely the formation of phrases or sound-units which have rhythmical value. It deals further with the general nature and character of these units, and with the relationship of these to pause. The final chapter considers the subject of compensating pause, or the metrical function of pause in the formation of English verse.

We shall turn now to the first topic, namely, an analysis of the conditions under which pause occurs in English poetry.

CHAPTER I

CONDITIONS UNDER WHICH PAUSE OCCURS MATERIAL INVESTIGATED

The material selected for investigation was from Milton's *Paradise Lost*, Book II, 604-653, and Book III, 1-55. The group of readers were M, Professor of General Linguistics in the University of Michigan; P, a teacher of Literature in an eastern academy for girls; H, a resident of Ann Arbor, a person with a wide knowledge of poetry; A, a teacher of English in an eastern college; I, an instructor in Oratory; B, an instructor in Rhetoric and the author of attractive verse; T, the head of the Department of Oratory in Michigan University; Pi, the head of the Department of Psychology; Ho, Assistant Professor in the Department of Oratory; and K and V, undergraduates in the Departments of Literature and General Linguistics.

The material with the pauses made in the five different readings follows. The numbers in parenthesis indicate the pauses in the material and the number of times they were made by the different readers. The edition used is Masson's.

- 604 They ferry over this Lethean sound
605 Both to and fro, (5) their sorrow to augment, (5)
606 And wish and struggle, (2) as they pass, (5) to reach
607 The tempting stream, (5) with one small drop (2) to
lose (1)
608 In sweet forgetfulness (4) all pain and woe, (5)
609 All in one moment, (5) and so near the brink; (5)
610 But Fate withstands, (5) and, to oppose the attempt, (5)
611 Medusa with Gorgonian terror (1) guards
612 The ford, (5) and of itself (1) the water flies (1)
613 All taste of living wight, (5) as once it fled
614 The lip of Tantalus. (5). Thus roving on (2)
615 In confused march forlorn, (5) the adventurous bands, (4)
616 With shuddering horror pale, (5) and eyes aghast, (5)
617 Viewed first their lamentable lot, (5) and found
618 No rest. (5) Through many a dark and dreary vale
619 They passed, (5) and many a region dolorous, (5)
620 O'er many a frozen, (4) many a fiery Alp, (5)
621 Rocks, (3) caves, (2) lakes, (3) fens, (5) bogs, (3) dens
(3), and shades of death—(5)

- 622 A universe of death, (5) which God by curse (3)
 623 Created evil, (5) for evil only good; (5)
 624 Where all life dies, (5) death lives, (5) and Nature
 breeds, (3)
 625 Perverse, (5) all monstrous, (5) all prodigious things, (5)
 626 Abominable, (5) inutterable, (5) and worse (1)
 627 Than fables (1) yet have feigned (3) or fear conceived, (5)
 628 Gorgons, (4) and Hydras, (5) and Chimaeras dire. (5)
 629 Meanwhile (1) the Adversary of God and Man, (5)
 630 Satan, (4) with thoughts inflamed of highest design, (5)
 631 Puts on swift wings, (5) and toward the gates of Hell (5)
 632 Explores his solitary flight: (5) sometimes (1)
 633 He scours the right-hand coast, (5) sometimes the left; (5)
 634 Now shaves with level wing the deep, (5) then soars (2)
 635 Up to the fiery concave (1) towering high. (5)
 636 As when far off at sea (4) a fleet descried (4)
 637 Hangs in the clouds, (5) by equinoctial winds (5)
 638 Close sailing from Bengala, (5) or the isles
 639 Of Ternate and Tidore, (5) whence merchants bring
 640 Their spicy drugs; (5) they on the trailing flood, (5)
 641 Through the wide Ethiopian to the Cape, (5)
 642 Ply stemming nightly (1) to the pole: (5) so seemed
 643 Far off (1) the flying Fiend. (5) At last appear
 644 Hell-bounds, (5) high reaching to the horrid roof, (5)
 645 And thrice threefold the gates; (5) three folds were
 brass, (5)
 646 Three iron, (5) three of adamantine rock, (5)
 647 Impenetrable, (5) impaled with circling fire, (3)
 648 Yet unconsumed. (5) Before the gates there sat (3)
 649 On either side (1) a formidable Shape. (5)
 650 The one seemed woman (1)¹ to the waist, (4) and fair, (5)
 651 But ended foul (3) in many a scaly fold, (5)
 652 Voluminous (1) and vast—(5) a serpent armed
 653 With mortal sting. Paradise Lost, Book II, 604-653.

- 1 Hail, holy Light, (5) offspring of heaven first-born! (4)
 2 Or of the Eternal (4) coeternal beam (5)
 3 May I express thee (2) unblamed? (5) since God is light (4)
 4 And never but in unapproached light (4)
 5 Dwelt from eternity—(5) dwelt then in thee, (4)

¹ Doubtful.

- 6 Bright effluence (4) of bright essence (1) increate! (5)
7 Or hear'st thou rather (1) pure Ethereal Stream, (5)
8 Whose fountain who shall tell? (5) Before the Sun, (4)
9 Before the Heavens, (2) thou wert, (5) and at the voice
10 Of God, (3) as with a mantle, (4) did'st invest (2)
11 The rising world of waters (4) dark and deep, (5)
12 Won from the void and formless Infinite! (5)
13 Thee I revisit now (2) with bolder wing, (5)
14 Escaped the Stygian Pool, (4) though long detained (1)
15 In that obscure sojourn, (5) while in my flight, (5)
16 Through utter (1) and through middle Darkness borne, (5)
17 With other notes than to the Orphean lyre (5)
18 I sung of Chaos (4) and eternal Night, (5)
19 Taught by the Heavenly Muse (3) to venture down
20 The dark descent, (5) and up to re-ascend, (4)
21 Though hard and rare. (5) Thee I revisit safe, (5)
22 And feel thy sovran vital lamp; (5) but thou
23 Revisit'st not these eyes, (4) that rowl in vain (3)
24 To find thy piercing ray, (5) and find no dawn; (5)
25 So thick a drop serene (2) hath quenched their orbs, (5)
26 Or dim suffusion veiled. (5) Yet not the more (1)
27 Cease I to wander (2) where the Muses haunt (3)
28 Clear spring, (4)¹ or shady grove, (4) or sunny hill, (5)
29 Smit with the love of sacred song; (5) but chief (2)
30 Thee, (3) Sion, (4) and the flowery brooks beneath, (5)
31 That wash thy hallowed feet, (5) and warbling flow, (5)
32 Nightly I visit: (5) nor sometimes forget (1)
33 Those other two (5) equalled with me in fate, (5)
34 So were I (1) equalled with them in renown, (5)
35 Blind Thamyras (3) and blind Maeonides, (5)
36 And Tiresias (4) and Phineus, (5) prophets (1) old: (5)
37 Then feed on thoughts (1) that voluntary move (2)
38 Harmonious numbers; (5) as the wakeful bird
39 Sings darkling, (5) and, in shadiest covert hid, (5)
40 Tunes her nocturnal note. (5) Thus with the year (2)
41 Seasons return; (5) but not to me returns
42 Day, (5) or the sweet approach of even or morn, (5)
43 Or sight of vernal bloom, (2) or summer's rose, (5)
44 Or flocks, (5) or herds, (5) or human face divine: (5)
45 But cloud instead (4) and ever-during dark (2)

¹ May be a very slight pause for the fifth reader.

- 46 Surrounds me, (5) from the cheerful ways of men (1)
 47 Cut off, (5) and, for the book of knowledge fair, (5)
 48 Presented with a universal blank (1)
 49 Of Nature's works, (5) to me (2) expunged and rased, (5)
 50 And wisdom at one entrance (2) quite shut out. (5)
 51 So much the rather thou, (3) Celestial Light, (5)
 52 Shine inward, (4) and the mind through all her powers
 53 Irradiate; (5) there plant eyes; (5) all mist from thence (3)
 54 Purge and disperse, (5) that I may see and tell (3)
 55 Of things invisible to mortal sight.

Paradise Lost, Book III, 1-55.

As we read over the material given above, noting the places at which the pauses occur, we find the pausing in the majority of cases to be as we should expect.¹ Our interest in the problem

¹ After the different readers had finished reading into the instrument, they were asked to mark the pauses in certain lines read as they thought they placed them, or as they thought they should be placed. The table gives the reader, number of lines read, number of pauses in the record, number of pauses marked by the reader, and the number of points of correspondence between the pauses in the record and the pauses as marked by the reader.

Reader.	No. of lines read.	No. of pauses in record.	No. of pauses indicated by reader.	No. of correspondences between pauses in the record and pauses as marked by the reader.
M	55	86	73	55
P	55	96	106	86
A	31	45	46	45
E	6	11	13	11
K	9	12	12	10
S	6	7	12	6
I	34	59	72	56
T	29	44	66	42
B	29	39	51	39

E, K, and S read small sections not included in the final results.

The pauses which do not appear in the records, but which are marked by the different readers are, first, those after pronouns. At these points,

centers about the questions of the function of pause, conditions under which it occurs, and reasons for variations among the readers in making pauses. We are also interested in the connection between pausing and punctuation. Does punctuation influence pausing, or should we pause in much the same manner if there were no marks? Does a particular system of punctuation in any way affect the rhythm of verse? It is pertinent at the beginning of the investigation to attempt to answer these questions by stating briefly the function of pause, and the conditions which govern its appearance in poetry.

Pause has already been defined as a cessation of movement in the vocal organs and is, therefore, physiologically considered, muscular rest. Acoustically, it is silence. Its function psychologically is to separate from each other ideas, or important phases of ideas, in order that the mind may grasp these as logical units. These units are called by Scripture¹ phonetic units in opposition to the term phonetic elements, which latter are the sounds of letters, syllables, and words. Phonetic units are formed by the fusion of the elements into sound groups which have an independent existence and are not the sums of the sounds of the elements. Two processes, therefore, are instrumental in the formation of logical or sound-units: the process of distinction, and the process of fusion. The chief causes physiologically for fusion are rapidity and frequency of utterance. The chief means employed in the process of distinction is pause; other means of distinction to be considered later are, for the most part, closely associated with pause.

possibly, greater intensity may be mistaken for pause. There is, secondly, a good deal of discrepancy for nearly all readers between the records and the pauses marked by the readers, at the end of the line; for some readers more pauses appear at the end of the line in the record than they indicate in the material; for other readers the reverse is true. The pause, thirdly, often does not appear in the records at points where we should naturally expect it, as after sun, line 8, Sion, line 30, bloom, line 43. At these points, apparently, readers allow unusual duration of the word to take the place of a pause, a point to be discussed later.

In general, the table indicates that readers think they make far more pauses than they do. T remarked, after reading, that many more pauses are made than one supposes; he indicates twenty-two more than appear in the records. I, also, marks many more pauses than appear in the records. M, the professor of phonetics, indicates thirteen fewer pauses than are found in his records. His theory is that far fewer pauses are made than is ordinarily supposed to be the case. The truth for poetry seems to lie somewhere between the theory of the students of oratory on the one hand, and of phonetics on the other.

¹ Scripture, *Elements of Experimental Phonetics*, p. 453.

SIMPLE, VARIABLE, AND COMPLEX UNITS

In order to obtain a clear understanding of pause and its use in poetry, it is necessary to examine more closely the nature of phonetic units. In the first place it is clear that certain units are fixed in character, that is, all persons would ordinarily pronounce them as units; no one would make a pause at any point. Of such a character are the phrases "Before the Sun, Before the Heavens," Book III, 8-9. Other phrases are variable as to the continuity of sound or of muscular activity. Some readers will fuse into one phrase, words which other readers, or the same reader at another time, will pronounce in two or more parts; as,

Before the Heavens, // thou wert,	P. L. III, 9
Thee // I revisit now // with bolder wing,	P. L. III, 13
but chief	

Thee, // Sion,	P. L. III, 29.
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The last phrase was variously paused in the different readings; and it was probably felt to be a unit in itself even by those who introduced slight pauses. A third sort, which may be called complex, consists of a phrase, complete in itself, but with short pauses within. Examples of this sort are:

O, // well for the fisherman's boy,
and

Or flocks, // or herds.

These might also be pronounced as single phrases, but when interrupted by a pause, may still be regarded as unbroken thought-units rather than as consisting of two distinct units.

CONDITIONS UNDER WHICH PAUSE OCCURS,—LOGICAL

With these distinctions in mind the next question to be determined is under what conditions pauses occur. The matter will be considered first from the logical point of view. 'It is not necessary to state all conditions under which pause occurs to mark off simple logical units, that is, conditions universally recognized. Here it is necessary to define only those cases of pause that are unpunctuated and not observed by all readers.

A study of Milton's blank verse reveals one striking difference between prose and poetry in the arrangement of language, namely, a more frequent use in the latter of inversion; and this inversion of the natural prose order of words tends to produce a pause. Examples of inversion in the material studied are:

Or of the eternal coeternal beam, P. L. III, 2
A pause was made after the word eternal by four different readers.

From the cheerful ways of men
Cut off, P. L. III, 46
A pause was made after men by one reader.

All mist from thence
Purge and disperse, P. L. III, 53
A pause was made after thence by three readers. If, however, the inverted part is a single word or a short phrase, it is usually fused, unless very emphatic, with the following phrase or with the preceding phrase; as,

Thee I revisit now P. L. III, 13
but not to me returns

Day, P. L. III, 41
A restoration of the longer inverted phrases to the normal order usually eliminates the pause.

A group of words tends to be split up by some readers into two units if an emphatic particle is inserted in the midst of the group. Examples are:

Thee I revisit now with bolder wing, P. L. III, 13

But cloud instead and ever-during dark, P. L. III, 45

Pauses were made after now by two readers, and after instead by four. If these words are eliminated the possibility of a pause is lessened, although it is true that if the word preceding the particle is made emphatic a pause might still occur. If, however, these particles occur near the beginning of a line or near the end, they would ordinarily be fused with the whole group.

A third arrangement of language tending to produce pause is that of a phrase inserted between words logically belonging together. The pause occurs at the close of the inserted phrase; the first part of the split phrase is, as ordinarily spoken, fused with the following phrase. Examples are:-

And wisdom at one entrance quite shut out. P. L. III, 50

A pause was made by two readers after entrance.

Thus with the year

Seasons return, P. L. III, 40

A pause was made by two readers after year.

Another arrangement of phrases which produces pause, or tends to do so in poetry, is that of compound elements, especially when these elements are words and phrases of some length. Examples are:

Than fables yet have feigned or fear conceived, P. L. II, 627
Three readers paused after feigned.

I sung of Chaos and eternal Night. P. L. III, 18
Four readers paused after Chaos.

Finally there are the cases of a pause occurring between subject and verb, and between verb and object,—cases which are sometimes regarded as examples of disagreeable splitting of phrase. In the material investigated, such a pause occurs after invest, line 10. In the consideration of these cases, which presented by far the greatest number of those which gave rise to doubt as to whether or not a pause occurred, and which called for the most careful comparison, such as that described in the introduction, shall we ascribe the pause to logical considerations, or must it be ascribed to some other cause? Some of these cases seem at first hardly to be justified on logical grounds, such as

Then feed on thoughts that voluntary move

Harmonious numbers;

P. L. III, 37

It is nevertheless possible to regard all these cases as consisting of two logical units. If we take the sentence
and ever-during dark

Surrounds me

P. L. III, 45

it is possible to consider the whole as one unit; but it is possible also, especially when one enters into the thought fully and speaks slowly, to think first of ever-during dark as one concept and surrounds me as a second. Examples of a pause between subject and verb in the lyric poetry studied are:

Kentish Sir Bing // stood for the king,
and

The horns of Elf-land // faintly blowing.

The same division may occur in prose when the subject or object is long. When the subject or object is very short, as "I saw him," no pause would occur unless some element is made emphatic. The shortness of the sentence, as well as its familiarity, has fused it into a unit. Pause, then, between subject and verb or between object and verb will occur with some readers when the (subject or object is modified and thus becomes logically and acoustically of sufficient importance to stand alone.)

All the conditions described above are conditions which may produce a pause; but the parts into which the phrase is separated are all fairly long. An examination of the material shows that a pause may also occur occasionally after a shorter unpunc-

tuated unit. Such pauses are the result of emphasis; to the listener they were clearly made for that purpose. Examples are:

Meanwhile // the adversary of God and man,	P. L. II, 629
voluminous // and vast	P. L. II, 652
prophets // old:	P. L. III, 36
May I express thee // unblamed?	P. L. III, 3
to me // expunged and rased,	P. L. III, 49

This tendency to break up longer units into shorter ones for emphasis is, however, rare. One or two other examples might be added to the ones given, but aside from a few doubtful cases the list above comprises the entire number in the material investigated. Moreover, in all but the last two examples, the pause made was made by one reader only; and in the last two cases it was made by only two readers.

The fusing of short elements into longer sound-units occurs constantly and is not materially hindered by punctuation marks. All connective words, exclamations, words of direct address, and other words set off by punctuation marks are usually fused with the phrase following or preceding. In a series of words the same tendency is shown, in that some readers, instead of reading each word separately, will group two or three of the words in the series together. Examples of phrases broken up by commas but spoken by some readers as a whole are:

Gorgons, and Hydras,	P. L. II, 628
¹ Hail, holy Light,	P. L. III, 1
Before the Heavens, thou wert,	P. L. III, 9
but chief	
Thee, Sion,	P. L. III, 30
and, in shadiest covert hid,	P. L. III, 39

Other examples may be found in the material given in Chapter V.

Some readers omit a pause even after a long unit, and thus will combine two comparatively long units into a very long one; but this practice is rare, as may be seen by consulting the table given on page 73 which indicates that the most frequently occurring units are those composed of four, six, eight, and ten syllables.

The separation of longer phrases into shorter ones and the fusion of shorter into longer ones is probably due to the rhythmical instinct; this and other possible conditions producing pause will be considered at a later point. It is necessary before leaving

¹The lengthening of a word at places where one would expect a pause is discussed on page 39.

the logical aspect of the problem to examine the connection of pause and punctuation. <We have seen that pause occurs with no punctuation, and also does not occur with it.> To what extent does this happen in the material studied? We are interested to know, also, to what extent punctuation follows natural pausing. We are especially interested to know, since this affects phrase rhythm, to what extent and under what conditions punctuation in itself may determine the making and position of pauses. We shall consider, first, the connection of pause and punctuation as actually revealed in a study of the records of the *Paradise Lost*.

The records show, in the first place, that all marks, except the comma (and the exclamation mark once) are invariably paused. The comma, however, is often not paused. Moreover, a pause frequently appears where there is no punctuation,—as has already been indicated. In order to provide definite results, a detailed study was made of the number of pauses occurring with punctuation marks, the number omitted with punctuation marks, and the number of pauses occurring with no punctuation. There are 151 marks in the two selections studied; and since each was read five times the results are based upon 755 marks.

No. of pauses made with punct. marks,	No. of pauses omitted with punct. marks,	No. of pauses oc- curring with no punct- uation,
693	62	147

Approximately 92% of all punctuation marks are paused, but only 75% are uniformly paused by all readers. About 8% of all punctuation marks are, therefore, omitted. About 18% of all pauses made are made without punctuation marks. These results indicate that pause and punctuation are fairly closely connected; but it is evident that if 8% of all punctuation marks have no pause, and if 18% of all pauses made occur with no mark, it is not safe to draw conclusions with reference to pause from punctuation marks.

In order to test more thoroughly the connection between pause and punctuation, M, I, and Ho were asked to read the first twenty-five lines of the selection studied, *Paradise Lost*, II, 604-628, with all punctuation marks eliminated. The reading in every case was done six months or more after the first reading. The following table gives the results for the selection both with and without punctuation marks for each reader. It gives the total number of pauses, the number of internal and end-pauses and the

average length of each. It gives, also, the total number of variations in placing the pause in the two readings; it is evident that the actual number of pauses might be the same but that there might be considerable divergence in the positions of the pauses in the two readings.

TABLE I

Showing differences in number, length, and placing of pauses in the same material, punctuated and unpunctuated.

	Total Number of Pauses.	Average Length. ¹	Number of Internal Pauses.	Average Length.	Number of End-Pauses.	Average Length.	Total Number of Variations in the two Readings.
Reader M							10
Punctuated	40	.4	27	.35	13	.48	
Unpunctuated	42	.4	28	.33	14	.47	
Reader I							10
Punctuated	47	.31	31	.29	16	.36	
Unpunctuated	41	.26	29	.23	12	.36	
Reader Ho							10
Punctuated	49	.43	35	.38	14	.42	
Unpunctuated	47	.47	31	.41	16	.44	

¹ The length of the pause with reference to the different punctuation marks is of interest. The following table is based upon the marks which occur in the *Paradise Lost* and in other selections throughout the dissertation. Zero results are not included in the averages.

Punctuation.	No Mark.	,	;	:	?	!	.	—	—
No. of marks.....	174	494	87	13	17	34	77	30	5
Aver. length.....	.26	.44	.55	.58	.65	.73	.75	.53	.47

The averages show an increase in time for no mark, comma, semi-colon, colon, question mark, exclamation mark, and period. There is a difference respectively between the marks, of .18, .11, .03, .07, .08, and .02. The ranges for the different marks are: the comma, .0 to 1.3; the semi-colon, .15 to 1.; the colon, .22 to .8; the question mark, .2 to 1.1; the exclamation mark, .3 to 1.25; the period, .3 to 1.05; the dash, .18 to .8; the comma-dash, .2 to .7; and no mark, .07 to 1.

The once popular notion that punctuation always indicates a pause, and that each mark has its appropriate and proportional pause, finds no support in these records.

The table indicates that the average length of the pause in the unpunctuated material is about the same as that for the punctuated. Of the different readers, M's average for the length of all pauses is the same for both readings; I's is .05 longer for the punctuated than for the unpunctuated; and Ho's is .04 shorter for the punctuated than for the unpunctuated. For the internal pause, M's average is .02 longer for the punctuated than for the unpunctuated material; I's is .06 longer for the punctuated, and Ho's is .03 shorter for the punctuated than for the unpunctuated material. For the end-pause, M's average is .01 longer for the punctuated material than for the unpunctuated; I's average is the same for both readings, and Ho's is .02 shorter for the punctuated material than for the unpunctuated. The average length of the pause, then, is not materially affected by the removal of punctuation marks; the average length of the end-pause remains about the same for all readers; the average length of the internal pause shows more variation in length for I and Ho than for M. I and M either keep the averages the same or make them slightly longer for the punctuated material than for the unpunctuated; but for Ho the reverse is true. Although no systematic effort was made to discover the difference in the length of the pause made by the same reader rereading the same material, I found in the records which were reread about the same differences as are here indicated. The comparison of the averages of M and I reading different material given on page 46, Table III, also indicates how nearly the same reader keeps to his own average pause-length. On the whole the results indicate that the removal of punctuation marks does not affect the length of the pause to any appreciable degree.

The total number of pauses made by all three readers in the punctuated material is 136; in the unpunctuated, 130, or six fewer. M makes two pauses less in the punctuated reading; I and Ho make six and two more respectively in the punctuated reading. The total number of internal pauses in the punctuated material is for all three readers 93; for the unpunctuated, 88,—or five fewer. The total number of end-pauses in the punctuated material is 43; in the unpunctuated, 42, or one less. The internal pauses rather than the end-pauses are, therefore, more extensively affected by the removal of punctuation marks. The rereading of punctuated material showed also more changes in the number of internal pauses than in the end-pauses; but not as great a change as is here indicated. I and M, rereading about twenty lines, made

two changes only in the number of the internal pauses. On the whole the number of pauses is not greatly affected by the removal of punctuation marks.

The next point to be considered is the extent to which punctuation marks determine pauses. There are in the material under consideration 45 punctuation marks; this read three times gives 135 marks. The total number of marks omitted in the first reading with punctuation was 12, or 9%. The number omitted in the second reading after words punctuated in the first is 19, or 14%; 5% more were omitted, therefore, with the removal of all marks. Of words unpunctuated in the first reading 14 were followed by pauses; in the second, or unpunctuated reading, 13 words which had no punctuation in the original were followed by pauses. Since there was only a slight difference among individuals in this particular, results for the different readers are not given.

Although the length of the pause and the number of pauses is only slightly affected by removing punctuation marks (possibly not at all), the actual placing of the pauses is considerably affected. The total number of variations for each reader in both readings is 10. My method of counting variations was as follows: if a reader read the punctuated line paused in this manner,

Gorgons, // and Hydras, // and Chimaeras dire //;
and the unpunctuated line in this manner,

Gorgons and Hydras and Chimaeras dire //

I counted this two variations, and one correspondence. Some of these variations were due not to punctuation but to a change in emphasis; for example one reader in the first reading makes a pause after wish in the line "and wish and struggle as they pass." In the second reading he places a pause after struggle. Other changes unconnected with punctuation were due to the fact that a reader would fuse two phrases into one in one reading and not do so in the other reading. For example, one reader in the first reading read the line "Thus roving on in confused march forlorn" with a pause after on; in the second reading this pause was omitted. The largest number of variations occurred in such punctuated phrases as "Gorgons, and Hydras," and "nature breeds, perverse," the tendency being for readers to omit the pause in these phrases when the punctuation mark was omitted. Eight of the thirty variations occurred in the line "Rocks, caves, lakes, fens, bogs, dens, and shades of death." M read it in the punctuated form as follows:

Rocks, caves, lakes, // fens, bogs, dens, // and shades of death.
In the unpunctuated form as,

Rocks, // caves, // lakes, fens, // bogs, // dens, and shades
of death.

Of the total number of variations, 30, six are at the end of the line; the others occur within the line. Nineteen of the variations occur after punctuated words; and the larger number of these are in the short phrases, the pause being more generally omitted, as has already been said, in these phrases when the punctuation is omitted.

It is clear from the facts given above that punctuation may to some extent affect the placing of pauses and consequently the rhythmic character of poetry. For this reason it is interesting to compare Milton's punctuation of his early poems,¹ and that of the 1667 edition of the *Paradise Lost*, with Masson's punctuation of the same material. In general it may be said that Milton's punctuation of his MSS. follows natural speech rhythms more closely than does the punctuation in modern editions of his works. Milton omits punctuation marks after all particles and smaller elements, but inserts marks between the parts of a compound sentence. The material is thus broken up into more nearly equal sound-units. As a typical example of the difference in rhythm of the early and modern forms, if the punctuation is observed, is the following example: (ordinarily, however, the sense is not blurred by Milton's manner of punctuation as it seems to be here.)

Imperial rule of all the sea-girt isles
That, like to rich and various gems inlay
The unadorned bosom of the deep. Comus, 21

Milton punctuates the second line of this with one comma, and plainly for rhythmic effect:

That like to rich, and various gems inlay
Another example will further indicate the point:

No sooner had the Almighty ceased but—all
The multitude of Angels, with a shout
Loud as numbers without number, sweet
As from blest voices, uttering joy—Heaven rung
With jubilee. P. L. III, 344.

¹ The writer is at present making a more detailed study of Milton's punctuation of his MSS. and the modern editor's punctuation of the same material.

In Beeching's reprint there is but one point, a comma after voices.

No sooner had the Almighty ceased but all
The multitude of angels with a shout
Loud as numbers without number sweet
As from blest voices, uttering joy Heaven rung
With jubilee.

In the few tests which were made by means of the records to determine the influence of punctuation upon pause, it was found to be generally true that a single word set off by a comma is, in spite of the comma, not paused; but a longer phrase followed by a comma usually has a pause. If the comma is omitted after the longer phrase a pause will nevertheless occur about as often as if the comma were present.

The manner in which poetry is punctuated does, therefore, affect the pausing and consequently the rhythmical flow of phrases; indeed, punctuation which is purely syntactical in character may change or mar to some degree the larger rhythm which the phrase, properly handled, creates.

To illustrate the point, Milton's Song on a May Morning was given to a reader, first as punctuated in the Cambridge reprint of the 1645 edition and then as it appears in Masson. The two forms are as follows:

Now the bright morning star, // Day's harbinger, //
Comes dancing from the east, // and leads with her
The flowery May, // who from her green lap throws
The yellow cowslip, // and the pale primrose. //
Hail bounteous May that dost inspire //
Mirth and youth, // and warm desire, //
Woods and groves, // are of thy dressing; //
Hill and dale, // doth boast thy blessing. //
Thus we salute thee with our early song, //
And welcome thee, // and wish thee long. //

—Cambridge Reprint.

Now the bright morning star, // Day's harbinger, //
Comes dancing from the east, // and leads with her
The flowery May, // who from her green lap // throws
The yellow cowslip, // and the pale primrose. //
Hail, bounteous May, // that dost inspire
Mirth, // and youth, // and warm desire! //
Woods and groves are of thy dressing; //

Hill and dale doth boast thy blessing. //
 Thus we salute thee with our early song, //
 And welcome thee, // and wish thee long. //

—Masson's Edition.

The oblique lines indicate that for this reader the punctuation was closely followed in making pauses. The reader was given no hint as to why he was asked to repeat the reading. A rather interesting variation between the two readings is seen in the pause after *inspire* in the first reading and the omission of it in the second reading; and for the second reading the appearance of a pause after *lap*.

To sum up the connection between pause and punctuation as discovered in this investigation, we find that 92% of all marks are paused, but that only 75% of all marks are uniformly paused by all readers. Eighteen per cent of all pauses occur with no marks. We have found, further, that the removal of all marks affected only slightly the number of pauses: the total number of unpunctuated pauses remained about the same; but the number of punctuated pauses was reduced 5% when the marks were removed. The position of the pauses was, however, considerably altered, as the number of variations indicated. It is also evident that the manner of punctuating material affects to some degree the phrase-rhythm of poetry.

CONDITIONS UNDER WHICH PAUSE OCCURS—METRE, RATE, RHYTHM, RIME.

Metre and Rate

The conditions giving rise to pause which we have thus far considered are essentially logical in character; and a close examination of the material investigated indicates clearly that all pauses are made only at points logically possible; a pause does not fall in the midst of a simple thought unit, or does not normally do so. Nevertheless two or more indivisible units may be fused by some readers into a longer unit; thus groups of words will occur having points within them at which it is logically possible to pause, but with no pause occurring. Hence arise variations in the number and the placing of pauses. That one reader makes a larger number of pauses than another is due to emphasis, to emotion, to the rhythmic impulse, to a small lung capacity, or to a desire to bring out fully both form and thought. The various

forces which produce pauses at logical points in poetic discourse are so complex that it is impossible to state positively that this or that phenomenon in itself produces a break. Among the causes which may produce pause are a change in metre, a slower rate, rhythm, and rime. An example of a pause occurring with a change in metre is seen in iambic verse when a line, or a phrase within a line, opens with a trochaic foot; as,

Which now the rising sun gilds with his beams. P. L. III, 551

So may some gentle Muse

With lucky words favor my destined urn. Lycidas, 20

Those other two equalled with me in fate. P. L. III, 33

All these lines showed a pause in the records before the trochaic foot.

Rate clearly affects the number of pauses. M, whose total time of speaking in the first selection is the smallest, has the fewest pauses. This is true for Pi and for B. In general it is also true that those whose total time of speaking is the longest have the largest number of pauses.

Rhythm

The main reason undoubtedly for pauses occurring for some readers and not for others at certain points is the difference among them in the matter of rhythmic reaction. Some readers are more concerned with the ideas. Their minds, intent upon the communication of these,¹ speak themselves out more rapidly and in less frequently interrupted sound. On the contrary, other readers react more emotionally to the same content, and tend consequently to break up longer units into shorter ones or to combine very short elements into longer ones, thus making phrases which are approximately more nearly equal than are those of non-rhythmical discourse.²

In rhythmical discourse, such as Milton's blank verse, the language is so arranged that all readers must pause at numerous points, which pausing for the rhythmically sensitive reader sets a pace that determines pauses at other points logically possible.

¹ See Professor F. N. Scott's paper, The most fundamental differentia of poetry and prose. Modern Language Assoc. Pubs., June, 1904.

² A few records made of prose of various sorts indicated that unimaginative prose had comparatively few pauses and that these were very irregularly placed. Imaginative prose had the pauses placed very much as they are in blank verse.

In this sense rhythm determines pause.¹ Such a pause is ordinarily called a rhythmical pause by writers on prosody and is regarded as one different in character from the so-called grammatical or logical pause. Schipper² points out cases in which he declares that the rhythmical pause is more strongly marked than the logical pause occurring in the same line. Examples cited are:

The time doth fleet and I // see how the hours do bend.

That when I think upon // the distance and the space.

And see the holy // edifice of stone,

As if predestination // overruled.

The third example seems to me impossible. The first certainly would be differently paused by different readers; but a pause after I is not illogical, since as has already been said, a subject may be conceived of as a unit apart from the predicate. "I think upon" may be regarded as equivalent to "something to think about," that is, the preposition is really a part of the verb. The pause in the last example would usually be omitted but might occur for emphasis.

To this point I have spoken exclusively of the rhythm produced by the sound-unit. The relationship of these units to the line, which is also a rhythmical unit, and the influence of the line in producing a pause have not been considered. It will be shown later from a study of the records that 70% of the lines studied in the *Paradise Lost* are end-stopped. In these cases the line is either an equivalent of a sound-unit, or is a combination of units. The particular question to be answered now is, Does the line in poetry in itself, logical conditions being assumed, sometimes produce a pause?

Before attempting to throw any light upon this question, it is necessary to state that readers vary greatly in the placing of end-pauses. This variation is probably due to the different emphasis which readers place upon phrases and lines as rhythmical elements; some readers follow the phrase, letting that determine the rhythm; they like "the sense variously drawn out from one verse into another." Other persons place great emphasis upon the rhythm produced by the line, and therefore reduce the number of enjambed lines. Both tendencies are shown by the records. A professor of English Literature told the writer that he

¹ Phenomena other than pause which may mark the close of sound-units are considered on page 39.

² Schipper, *Englische Metrik*, Vol. 2, p. 27, 1888.

could not endure to hear any one read Milton who did not pause at the end of every line. He felt there should be a perceptible pause after returns in the line,

but not to me returns

Day.

Not to read it thus destroys the rhythm for him; for others the rhythm is destroyed by such a reading, since Day thus isolated would make for them a sound-unit logically and acoustically inadequate.

To test the question of the influence of the end of the line, in reality the influence of line-rhythm, in producing pause, the old device of printing poetry as prose was resorted to. The different readers omitted some pauses at certain points where they had previously placed them; but in sentences like

Thus with the year /

Seasons return;

from the cheerful ways of men /

Cut off.

All mist from thence /

Purge and disperse.

the pauses in most cases appeared, as indicated, and as the reader had placed them for poetry. In the case of the separation of subject from verb, or verb from object, the pause was usually eliminated. The pause appeared, however, for one reader in the line

Nor sometimes forget

Those other two.

I found that in the case of highly rhythmical verse printed in prose form almost no difference was made in the pausing. The following extract from Milton, Book I, lines 544-51, was given to three different readers two of whom did not recognize it as poetry; the third remembered that it was poetry, but could not remember how the lines were arranged. It was read in the prose form first.

All in a moment through the gloom were seen
Ten thousand banners rise into the air,
With orient colours waving: with them rose
A forest huge of spears; and thronging helms
Appeared, and serried shields in thick array
Of depth immeasurable. Anon they move
In perfect phalanx to the Dorian mood
Of flutes and soft recorders—

The pauses made by the first reader were for the prose form exactly like those for the verse except that for the verse form he placed a pause after array. A second reader kept the pauses the same. The third placed pauses in the verse form after every line except the one ending in helms. In the prose form he made no pauses at those points which would be in the poetry end-pauses, except after air and mood. For this reader there was a distinct difference between the two. This person evidently more markedly than the other two reads poetry by lines. The end of a line of poetry, then, may cause a pause, that is, may produce a break at a point where none occurs for the same reader if the material is in prose form. But the end of the line, per se, cannot produce a pause. The phrasing must be such as to make a pause possible.

Pause and Rime

Stetson¹, experimenting with meaningless syllables, found that the pause after rimed verse as compared with the pause after unrimed verse is, in general, decidedly shorter. He concludes that rime is a means of producing freedom and enjambment. In view of these conclusions, I give the following results, based upon a study of rimed verse:

TABLE II

Poem.	Average Length of End-pause.	Number of Lines.	Number of End-pauses.	Percentage of End-stopt Lines.
L'Allegro .....	.38	16	12	75%
The Forsaken Merman .....	.58	8	8	100%
Song on May Morning .....	.48	9	7	77%
Cavalier Tunes .....	.53	12	12	100%
Christabel .....	.51	14	14	100%
Break, Break, Break .....	.53	8	8	100%
The Cloud .....	.47	11	9	80%
Sing a Song of Sixpence .....	.32	11	9	80%
The Lady of Shalott .....	.54	8	7	87%
Bugle Song .....	.66	15	15	100%
Total	—	112	101	—
Average .....	.50	—	—	90%

¹ R. H. Stetson, *Rhythm and Rhyme*. Harvard Psychological Studies I, 449.

Stetson's hypothesis that there is some definite process at the end

The average length of the end-pause for these selections is .50; for the *Paradise Lost* selections, it is .47. There is, therefore, for these selections a difference of .03 secs. in the length of the end-pause. The number of run-on lines in these poems is 10% of the whole, or one-third less than for blank verse (See page 33). I do not believe that rime exerts any influence upon enjambment; on the contrary it is more likely to produce a pause if the meaning will permit a pause. It may to some extent affect the length of the pause. Enjambment in rimed verse, as in blank verse, is a matter of the arrangement of phrases. One method of testing the question of the influence of rime upon pause would be to compare the reading of a freely organized specimen of rimed verse with the same specimen, but with the rimes eliminated. I give the results of a reading of a few lines from Keats. The unrimed selection is taken from C. M. Lewis's book, *The Principles of English Verse*. Dr. Lewis eliminated the rimes in order to show that they played no organic part in the verse construction.

Reader, L.

(The numbers in parenthesis indicate the points at which end-pauses were made and the length of the pause. End-pauses only are given.)

A thing of beauty is a joy forever; (.5)
 Its loveliness increases; it will ne'er
 Pass into nothingness; but still will keep
 A bower quiet for us, and a slumber
 Full of sweet dreams, and health, and quiet brooding. (.6)
 Therefore, on every morrow, do we wreath
 A flowery band to bind us to this world, (.4)
 Spite of despondence, and of the inhuman dearth (.2)
 Of noble natures,—

Keats' *Endymion* as rewritten by C. M. Lewis.

A thing of beauty is a joy for ever: (.6)
 Its loveliness increases; it will never
 Pass into nothingness; but still will keep

of the verse which marks the close of the verse and which takes more time in the case of blank verse than in the case of rimed verse may be true; but my results indicate that the increased time for blank verse is not accounted for by the pause but by the increased length of the word at the end of the line. Rime may perform the function of this increased quantity in marking the end of the verse but the records of *L'Allegro* and other rimed verse do not decisively establish this point.

A bower quiet for us, and a sleep
 Full of sweet dreams, and health, and quiet breathing. (.8)
 Therefore, on every morrow, are we wreathing
 A flowery band to bind us to the earth, (.7)
 Spite of despondence, and the inhuman dearth (.3)
 Of noble natures,—

Keats: *Endymion*.

The pauses in the two selections occur at the same points. In every case the length of the pause is greater in the original with the rime. The average length of the pause without rime is .42; with rime, .6. Rime, for this reader, exerted no influence in producing pause, but did seem to lengthen the pause. The reader said she thought in reading the first selection that it was the original with rimes. Although, as has been said, rime probably does not in itself produce a pause, it is nevertheless undoubtedly true that rime occurring at a logically possible point of division might for some readers produce a pause at that point. In this sense it may be said to produce a pause. An examination of the lyrical verse given in Chapter IV illustrates the point.

In this chapter it has been stated that the function of pause is the separation of groups of words held together by meaning. It is evident from a study of the material investigated that pauses never occur normally unless there is a possibility of a break in meaning. There are, however, many points in discourse at which it is possible to pause as far as the meaning is concerned, but at which either no pause is made or is made only by some readers. Various forces tend to produce pauses at such points. The principal ones are inversion in the natural order of phrases as well as other phrase arrangements, emphasis, punctuation, change in metre, rate of speaking, and the rhythmic instinct. The rhythmic impulse will cause some readers to make pauses in such a way that the sound-unit is approximately a regularly occurring element. Pauses thus become artistic in function, creating sound-units which, with their ever changing cadences, produce a larger rhythm of great value in Milton's blank verse. The nature of the sound-unit will be examined in detail in Chapter III. In the following chapter we shall examine more particularly the nature of the pause itself.

CHAPTER II

NUMBER, POSITION, AND LENGTH OF PAUSES IN THE MATERIAL INVESTIGATED

In the preceding discussion it has been presupposed that the sound-unit is a rhythmic element. To show that it is in fact a unit capable of performing a rhythmic function it is necessary to point out that readers perceive it as such by the pauses which they make. The first problem, therefore, is to determine where readers place their pauses, how frequently they make them, and how long they pause. The degree of uniformity in the position, number, and length of the pauses is also of interest as indicating to what extent readers respond alike to the same material. Such knowledge is valuable for critical judgments and for the interpretation of poetry. On the whole the tables indicate to the interested student a remarkable uniformity among the eleven readers in the average length of the pause and in the number made.

The group of readers has already been described on page 9. In the table which follows the points of division represent partial changes in the group of readers; no group was entirely changed. The table gives for each reader the number of internal pauses, or pauses within the line, and the average length of the internal pause; the number of end-pauses for each reader and the average length; the number of both internal pauses and end-pauses, the average length, and the range in length for each reader. Finally the median and mode of the total number of pauses are given. The average for each division is also given. In the last two lines are, respectively, the sum of the averages of the different pauses, and the average length of them for the material as a whole.

TABLE III
Number and Length of Pauses

Reader.	No. of Internal Pauses.	Aver. Time of Internal Pauses.	No. of End- Pauses.	Aver. Time of End-Pauses.	Total No. of All Pauses.	Aver. Time of All Pauses.	Range in Time.	Median.	Mode.
Division I. <i>Paradise Lost</i> , Book II, 604-653									
M	46	.43	28	.44	74	.44	.07- .98	.43	.6
I	48	.34	32	.33	80	.34	.08- .8	.3	.3
Ho	56	.45	33	.46	89	.45	.1 - .95	.42	.39
K	47	.50	34	.48	81	.49	.08- .82	.5	.5
V	51	.44	36	.44	87	.44	.1 - .9	.46	.4
Aver. ..	50	.43	33	.43	82	.43	.07- .98	.42	.45
Division II. <i>Paradise Lost</i> , Book III, 1-26½									
M	19	.45	19	.43	38	.44	.08-1.	.41	.6
P	23	.44	20	.56	43	.50	.15-1.25	.5	.5
H	22	.53	20	.65	42	.59	.15-1.3	.6	.8
A	24	.45	21	.52	45	.48	.1 - .9	.42	.4
Pi	12	.65	14	.28	26	.45	.1 -1.02	.5	.8
Aver. ..	20	.50	19	.49	39	.49	.08-1.3	.49	.62
Division III. <i>Paradise Lost</i> , Book III, 26½-55									
M	27	.40	19	.50	46	.45	.1 -1.	.45	.2
P	30	.42	24	.51	54	.47	.1 -1.05	.5	.55
B	22	.27	18	.30	40	.29	.06- .75	.26	.5
T	27	.46	18	.58	45	.52	.1 - .92	.5	.6
I	33	.32	17	.48	50	.40	.07- .7	.4	.4
Aver. ..	28	.37	19	.47	47	.43	.06-1.05	.42	.45
Sum of									
Aver. ..	98		71		168				
Aver. for all divi- sions ..		.43		.46		.45	.06-1.3	.42	.50

The total number of pauses made by all readers is 840; of internal pauses, 487; of end-pauses, 353. There are about one-third more internal pauses than end-pauses. In the second division of the material the number of the end and internal pauses is more nearly equal.

In connection with the problem of the number of pauses, the question arises as to the relation of the number of both the internal and end-pauses to the number of lines. The number of lines studied is 102. On the basis of the average number of end-pauses made, approximately 70% of the lines have end-pauses. Among the eleven different readers the lowest percentage of end-stopped lines is 54; the highest is 86. The average number of run-on lines is 30%, a percentage far below that given by Schipper,¹ who estimates that the number of run-on lines in the *Paradise Lost* is 50%.

About 93% of the lines studied have one or more pauses within the line. Twenty-two lines have more than one pause within, but in many cases the second pause is made by but one reader; one may infer that for material such as the *Paradise Lost*, the average reader would pause twice within the line for only about ten lines in a hundred. In the selection studied there are just ten lines within which three or more readers make more than one pause.

A few records were made of poetry lyrical in character; in all 110 lines. For this sort of poetry it was discovered that 90% of the lines have pauses at the end of the line and 45% have one or more pauses within the line. This latter percentage is undoubtedly somewhat high, since many of the lines were chosen with more pauses in them than are usual in order to study compensating pause. The results given indicate that lyric poetry has more end-stopped lines than blank verse, and undoubtedly would have far fewer internal pauses.

Since judgments with reference to placing the pause have been subjective in character, it is interesting to notice to what extent the different readers pause alike. Within the 102 lines studied, 125 internal pauses are made. Of these 125 pauses, 68, or a little more than one-half, are made by all five readers; 85, or two-thirds, are made by four readers; and 96 of the 125 pauses are made by three readers. For the remainder, 29 in number, only one or two readers pause. There are but seven

¹ Schipper, *History of English Versification*, Book I, p. 238.

lines in which no pause occurs; but for any given reader this number would be greater.

The results given above are for the internal pauses. With reference to the uniformity among the five readers in placing the end-pause, we find that 87 of the 102 lines have a pause at the end. Of these 87 pauses, 53, or about five-eighths, are made by all five readers; 61, or three-fourths, are made by four readers; and 69 by three readers. There is on the whole a somewhat greater uniformity among the readers in placing the end-pause than in placing the internal pause. The lack of uniformity indicates how unreliable are judgments concerning pause and enjambment that are based upon a subjective analysis.

The position of the pause within the line with reference to the foot, or the number of syllables which it follows, is one of the chief questions discussed by writers on metrical problems. The following are the results for the material studied:

No. of syllables in the line preceding the pause.....	I	2	3	4	5	6	7	8	9
No. of times the pause occurs	11	54	34	120	53	147	20	46	2
Approximate average for each reading	2	11	7	24	10	29	4	9	.4

From these results it is seen that the pause appears most frequently after the fourth and sixth syllables, or after the second and third foot. It appears most rarely after the first, seventh, and ninth syllables. In the lyric verse studied it occurs most frequently after the fourth syllable, or second foot.

In order to study the difference among individual readers in the number of pauses made, it is necessary to examine the results for the three different divisions given in the table. In Division I, consisting of 50 lines, the average number of pauses made is approximately 82; the largest number made by any reader is 89, the smallest number is 74, a span of 15. In Division II, consisting of 26 lines, the average number of pauses is 39; the largest is 45, and the smallest is 26, a span of 19. The large difference in this division is due to the very few pauses made by Pi; the difference among the other readers is 7. In Division III, consisting of 29 lines, the average number of pauses is 47, the largest number is 54, the smallest is 40, a span of 14.

As for the internal pauses, the average number in Division I is 50, with a range of 46 to 56, a span of 10; in Division II the

average number is 20, with a range of 12 to 24, a span of 12; in Division III the average number is 28, with a range of 22 to 33, a span of 11. For the end-pause the number for the different readers in the three divisions ranges respectively from 28 to 36, a span of 8, with an average number of 33; from 14 to 21, a span of 7, with an average of 19; and from 18 to 24, a span of 6, with an average of 19. The number of end-pauses is more nearly the same for all readers than is the number of internal pauses.

It is of interest to note in the light of these results that the scientists, M and Pi, and the poet B make the fewest pauses. The largest number in Divisions II and III are made by P and A, the only women who read. Usually the larger number of pauses are made by the trained speakers, Ho, I, and T.

The next point to consider is the length of the pauses and the significance of this in verse composition. It will be seen from Table III that the average length of all pauses for the three divisions is .45 of a second. Wallin's¹ average length was also .45, —an interesting correspondence, since Wallin's results were obtained by a different method. The range in variation of averages for the different readers is from .29 to .59, a span of .3.

The average length of the internal pause for all divisions is .43, with a range of averages for different readers of .27 to .65, a span of .38 seconds. The average length of the end-pause is .46, with a range of averages from .28 to .65, a span of .37. The variation in the average length of the internal and end-pauses is practically the same.

The averages in the length of the pause for the three different divisions show a striking similarity. The average length of all pauses for the three divisions ranges from .43 to .49, a span of .06; for the internal pause, the variation is from .37 to .50, a span of .13; for the end-pause the range is from .43 to .49, a span of .06. That there should be in the reading of these passages, done by different readers, or by the same reader at widely separated intervals of time, so much uniformity is interesting and significant.

As to the relationship of the length of the internal pause to the length of the end-pause, since the length of the internal pause is .43 seconds, and the length of the end-pause is .46 seconds, it is seen that the two are practically of the same

¹ Wallin, *op. cit.*, p. 1.

length. Among the different readers, the difference in time between the two is slight. The least difference is 0, the greatest is .37 seconds. Excluding the result of Pi, the greatest difference is .16. Pi's results throughout differ considerably from those of the other readers. Eight of the readers make the internal pause shorter than the end-pause; one keeps the time the same; and two make the internal pause the longer. I makes it longer in Division I and shorter in Division III. For the lyrical verse studied the length of the internal pause is .28; the end-pause is .53. In this sort of verse the end-pause is about twice as long as the internal.

The length of the pause in blank verse varies from .06, the shortest pause of which I could be certain, to 1.3, the longest pause made by any reader. Pauses very rarely are one second long.

At any given point in the material the length of the pause as made by different readers varies greatly. The greatest variation was from .2 to 1.3, after the word *wing*, line 13, in the second selection. The least amount of variation was from .15 to .25, after the word *flocks*, line 44, of the same selection. These comparisons are based upon the pauses made by the five readers at the same point. In order to illustrate the point more fully I give the following table made up of words taken at random from the material studied, together with the length of the pause after the word as made by the different readers. The first column gives the reader; the second, the average length of the pause as made by each reader; then follow the lengths of the pauses made by each reader after the words given at the head of the column. The words are taken from the second and third divisions.

TABLE IV

Giving specimen variations in the length of the pause as made by different readers at the same point.

No. of line.....	3	6	10	13	17	24	25
Words	light	effluence	mantle	wing	lyre	ray	orbs
Reader.	Aver. time of all pauses.						
M .....	.44	.7	.3	.6	.2	.42	.6
P .....	.50	.7	.18	.4	.5	.4	.2
H .....	.59	.5	.15	.3	1.3	.1	.44
A .....	.48	.4	.4	.34	.4	.4	.6
Pi .....	.45	.0	.0	.0	.18	.2	.2

No. of line.....		31	31	36	41	43	47	51
Words		feet	flow	Phineus	return	rose	off	light
M .....	.45	.2	.4	.2	.45	.6	.8	.15
P .....	.47	.6	.5	.16	.5	.6	.65	.6
B .....	.29	.26	.16	.34	.2	.1	.25	.64
T .....	.52	.65	.1	.12	.5	.92	.58	.64
I .....	.40	.5	.25	.4	.3	.45	.3	.3

It will be seen from an examination of the table that the reader whose average time for all pauses is long is not habitually long at all places; he may at certain places have the longest pauses made, as, for example, H after the word *wing*, and T after the word *rose*; but these same readers may have at another point the shortest pause made, as H after the word *lyre*, and T after the word *flow*. B, who has the shortest average pause, may at times have the longest pause, as after the words *Phineus* and *light*. Nevertheless the length of the pause is, to some extent, due to a reader's habitual rate of reading. It is probable that at any given place the length of the pause is largely due to the manner in which a reader apprehends and interprets the thought and feeling of the selection which he is reading. Possibly one may say that the greatest degree of uniformity occurs after those words and phrases which seem logically and acoustically most important. In general the variation in the time of the pause after any given word is large, being on an average about .42 seconds.

Of greater significance for free blank verse is the variety¹ in the length of the pause as made by any one reader at different places in the material, since it is this variation in the length of the pause which contributes to the flexibility of verse and makes possible ever-varying sound groups. It is clear that if pauses were approximately the same length, even though they were placed as irregularly as Milton places them, the phrase would be too definitely marked; it would become monotonous and inflexible. When, however, the thought is of such a nature that the pause is naturally varied in length, the result is that phrase and

¹Those readers who brought out most pleasurably the beauty of Milton's verse were the ones who introduced the greatest variety in the time of pausing. It is this fact, as well as the matter of placing the pause, which contributes, in my judgment, in large measure to artistic pausing.

line units are kept, together with the rhythm which they produce, but are at the same time capable of being organized into larger rhythms.¹ They can become now a dominant rhythm, now a secondary one more or less submerged in the more massive rhythm of sentence and paragraph. In the creation of this sort of rhythm Milton is generally acknowledged to be the master craftsman. In early blank verse and much that appeared after Milton it is evident that no such wide range in the length of the pause is present. In order to test this point a selection from Shakespeare's early blank verse was given to I, whose reading usually shows a great diversity in the length and placing of the pause. The extract from Shakespeare is as follows:

(The numbers indicate the position and the length of the pauses.)

Is it mine eye, (.3) or Valentinus' praise, (.7)
 Her true perfection, (.3) or my false transgression, (.6)
 That makes me, reasonless, (.28) to reason thus? (.7)
 She's fair, (.35) and so is Julia that I love,—(.5)
 That I did love, (.5) for now my love is thawed, (.65)
 Which, like a waxen image 'gainst a fire, (.5)
 Bears no impression (.2) of the thing it was.

Two Gentlemen of Verona, II, iv, 196-202.

The end-pauses vary in time from .5 of a second to .7. The average length is .59. The end-pause here is much longer than for Milton. The internal pause varies from .2 of a second to .5, with an average of .32. These internal pauses are also not greatly varied in length. The ratio of the length of internal to end-pauses is as 1:2. The line-bound character is not so much due to the fact that a pause occurs at the end of every line, as to the fact that the pauses are all long, and are relatively of the same length. These pauses, also, are placed at fairly equal time-intervals. Until the sixth line is reached, the intervals between pauses measure 1.4 secs. with only slight variations from this time. This slight test is not offered as proof, but only as an indication of what in all probability does happen in formal blank verse, and as verifying what seems true to the ear.

¹The varying length of the syllables also contributes to the flexibility of the rhythm, but this is the rhythm produced by the metre and is not the one under consideration.

PHENOMENA ASSOCIATED WITH PAUSE

The most obvious sound phenomenon associated with pause is the great length of the word or syllable preceding the pause as compared with other words or syllables within the same unit. The question arises as to whether this length is due to or associated with the pause, or whether it is due to the poet's habit of placing before the pause a word naturally longer than other words in the same sound unit. It is undoubtedly true that, since the close of the phrase usually represents a point in discourse which is logically important, the word standing at this point is in itself also phonetically important. Nevertheless, the usually very marked length of the word before the pause seems to indicate that a word, even one naturally long, is still more greatly prolonged before a pause; and it is also true, as far as I have been able to compare results, that words and syllables which are generally regarded as short, are nevertheless often longer before a pause than they are within a sound-unit. To illustrate the point I offer the table on p. 40, which gives the length of a word or syllable at the end of a sound-unit, and the length of the same word spoken by the same reader, within a unit. The three different lengths which are given for the same words represent the results for three different readers.

It is true that the same word standing within different units also varies in length, and at times shows a marked degree of variation; just as the same word, standing before a pause will likewise show variation in length, as, for example, the length of break, in "Break, break, break" and of down in Arnold's line, "Down, down, down."¹ The point which I wish to make is simply that almost without exception, however greatly the same word may vary in length in different positions, any given word is longer before a pause than the same word anywhere within a sound-unit.

In order to illustrate further the influence of pause upon the length of the word preceding, I and K were asked to read a selection from Milton's *Paradise Lost*, and then were asked to reread the same selection as rewritten by Dr. C. M. Lewis in *Principles of English Verse*. Dr. Lewis rewrote the selection in order to show the difference between the effect of blank verse which is arranged so that the end of the line coincides with the end of the phrase, and blank verse in which there is no such correspondence.

¹ See page 73.

TABLE V

Giving word, length of word within a sound-unit, and length of the same word or syllable before a pause, as made by the same reader.

Word.	Length in the Sound-unit.	Length before Pause.	Syllable.	Length in Sound- unit.	Length before Pause.
thou .....	.45	.6	er	.1	.22
				.18	.25
thee .....	.3	.6		.2	.28
grey .....	.4	.55			
long .....	.4	.65	il	.15	.2
				.18	.3
bring .....	.33	.62		.15	.2
sun .....	.4	.7			
sing .....	.3	.5	ing ¹	.12	.34
me .....	.22	.5	y	.15	.28
on .....	.32	.52			
	.4	.62			
	.32	.38	ly	.2	.25
death .....	.4	.48			
	.5	.6			
	.3	.5	en	.2	.25
gates .....	.4	.5			
	.4	.5			
	.42	.54			
hell .....	.35	.48			
	.6	.8			
	.38	.44			
high .....	.24	.6			
	.4	.7			
	.32	.5			
king .....	.5	.8			
right .....	.46	.5			

¹I found one *ing* shorter by .05 before the pause than the same syllable within a sound-unit.

The numbers at the end of the line represent the length of the pauses made by the two readers. Only end-pauses are given.

Is this the region, this the soil, the clime,— .38, .2

Said then the lost Archangel,—this the seat .2, .3

That we must change for Heaven? this mournful
gloom .3, .2

For that celestial light? Be it so, since he

Who now is sovran can dispose and bid

What shall be right: farthest from him is best, .9, .7

Whom reason hath equaled, force hath made supreme

Above his equals. Farewell, happy fields, .6, .55

Where joy forever dwells! Hail, horrors, hail,—

Milton, *Paradise Lost*, Bk. I, 240-250.

Is this the soil, the clime,—said then the lost

Archangel,—this the region that we must

Exchange for heaven? this mournful gloom for that

Celestial light? Be it so! since he who now

Is sovran can dispose and bid what shall

Be right: farthest from him is best, for him .2

Hath force above his equals made supreme. .75, .8

Farewell, ye happy fields of heaven, where joy

Forever dwells! Hail, horrors, hail, and thou .1

Infernal world,—

Lewis's rearrangement of the above selection.

There are in the first selection two words at the end of the line which are followed by a pause, and which are repeated in the second selection, but are not there followed by a pause. These words are gloom, and fields. The length of these words is for the two readers respectively .65, .7; .6, .6. The length of these same words in the second selection, not followed by a pause, is .4, .5; .45, .5. The length of the unpaused words at the end of the line in the first selection, he and bid, is also longer than that of the same words in the second selection. For the first selection he is .4 and .5 sec. long; for the second selection, .3 and .3. Bid is .4 and .44 in the first, and .35 and .4 for the second selection. This last result brings us to another point that is evident in the records, namely, long words appear at those points at which there is no pause but at which a pause is logically possible, and also at which sometimes readers do pause. Before going further into this matter, it may be well to answer a possible objection. He and bid for both readers are longer in

the first selection than in the second, and this increase in length is apparently due to their position at the end of the line, or possibly to the metre.¹ May not these facts rather than the fact that they close a phrase be the cause which produces the length? That is, may it not be that any word whatsoever, regardless of its position in the phrase, will be longer if it is the last word in the line? Since the point is important for the understanding of verse construction, I will go into the matter somewhat. If it be true that the end of the line in itself, rather than the pause or a possible pause, occasions the lengthening of a word, then those words which stand at the end of the line in the second selection should be longer than they are in the first selection where they are in the midst of a phrase. I will give what actually happened.

The lengths of the last words of the lines in the second selection for both readers are given in the first line; the lengths of the same words as they are in the first selection but not at the ends of the lines, are given in the second line.

	lost	must	that	now	shall	him	joy
Length of word at at end of line..	.4, .45	.3, .25	.3, .15	.3, .4	.3, .3	.45, .35	.4, 6
Length of same word not at end of line .....	.5, .6	.3, .2	.3, .35	.35, .15	.4, .3	.3, .4	.4, .5

These few results indicate that the end of a line, if it does not correspond with the end of a phrase, does not in itself consistently affect the length of a word.

I have indicated that when the end of a line and the end of a phrase correspond, even if there is no pause, lengthening occurs, since at such a point a pause is possible. In the second selection such a point is after the word *him*. Other examples are given later. We find, further, that *now* and *joy* for one reader show greater length in the second selection than in the first; and this suggests another point; namely, that a line which ends with a word logically important may be prolonged even when such a

¹That the metre in itself does not fully account for the unusual length of a word before the pause may be seen by examining the length of words in the verse measured in Chapter IV on Compensating Pause. It may, however, be a contributing element.

word does not stand at the end of a phrase. A lengthening under such conditions, however, occurs rarely, as may be seen by examining the material in Chapter IV on Compensating Pause.

To this point we have discovered from our investigation of a few lines that words and syllables before a pause are almost always longer than when not followed by a pause; and that words before a possible pause are also long. Although in the discussion I have considered only words at the end of the line, the same observations hold true for words before a pause, or possible pause, within the line. The pause or the expectation of one may therefore cause the lengthening of a word. The word, of course, is in itself metrically and logically important, and the length is probably due to physical, metrical, and psychological factors. In any case the great length of a word before a pause occurs so frequently that it seems possible that it does at times take the place of a pause in the consciousness of the reader, and may be accepted by readers or hearers in place of a pause. This seems partly to account for the discrepancy between the number of pauses which occurred in the records and the number which the readers indicated in the material. The omission of a pause in the record and the placing of it in the text by the reader is especially likely to occur after words ending in *m*, *n*, *ng*. The records show for such words a cessation of tone coming through the mouth but a continuance of it in the nasal cavity. Naturally when a reader has closed his lips, he infers that he has come to the end of the sound even if he has not. In the line from a selection read by three persons,

All in a moment through the gloom were seen
Ten thousand banners rise into the air,

two of the readers did not pause after *seen*, but both indicated a pause in the material.

If it is true that a word greatly prolonged takes the place of a pause in the consciousness of the reader, there would then be a far greater uniformity among readers in the formation of sound-units. Precisely to what extent results would be altered it is difficult to determine, since one has no exact basis on which to make the calculation. If one could know precisely if all syllables, even weak ones, are perceptibly lengthened, and could know also how long they must be to take the place of a pause, the matter could be determined. Lack of knowledge upon these and other points makes the problem incapable of solution

at the present time. We may, however, assume that any syllable which measures .5, or over, is fairly long, and on this basis make a calculation. Since .4 is the average length of long syllables and since syllables .5 long rarely occur except before pauses or pause-places, the assumption is justified. I have measured the length of the syllables for three readers, I, K, and M, in Division I. If we add to the total number of pauses all words at the close of unpaused phrases .5 or more in length, we shall increase the uniformity of readers in marking off sound-units in this division from 87% to 96%. And if we add to the end-stopped lines all unpaused lines ending with syllables measuring .5 or over, regarding these as performing the function of pause, we shall increase the percentage of end-stopped lines from 63%, a low average, to 80%. Estimates of this sort are crude, but they have a certain value in indicating what may happen in artistically organized verse.

The conclusions which have been reached have been illustrated by reference to a small amount of material, but the points made rest in reality upon the observation of the records as a whole. I will give a few extracts taken from records made by different readers, which will serve further to illustrate the point. The same point is also illustrated in the material given under the discussion on Compensating Pause. The division into syllables follows the conventional mode for poetry.

Lines 7-12. Reader M

(Pauses are enclosed in parenthesis)

.3 .38 .3 .2 .18 .35 .1 .15 .25 .65
Or hear'st thou rath¹-er pure e-the-real stream, (.5)

.2 .3 .25 .3 .2 .5 .2 .3 .1 .6
Whose foun-tain who shall tell? (.6) Be-fore the sun,
.18 .25 .15 .35 .3 .45 .15 .2 .1 .48
Be-fore the Heavens, (.3) thou wert (.6) and at the voice
.1 .3 .18 .18 .05 .2 .25 .3 .25 .4
Of God, as with a man-tle, (.6) didst in-vest (.3)
.1 .25 .25 .3 .18 .22 .1 .4 .2 .25
The ris-ing world of wat-ers dark and deep, (.5)
.3 .25 .1 .4 .2 .25 .2 .2 .1 .2
Won from the void and form-less in-fi-nite. (.7)

¹ Division doubtful.

Lines 26-31. Reader T

.4 .4 .15 .5
Yet not the more (.15)

.4 .38 .2 .4 .2 .3 .1 .4 .2 .45
Cease I to wan - der where the Mu - ses haunt (.1)

.4 .62 .2 .25 .15 .6 .3 .4 .15 .65
Clear spring, (.4) or shad - y grove, or sun - ny hill, (.65)

.6 .2 .1 .35 .2 .25 .35 .65 .25 .45
Smit with the love of sa - cred song; (.45) but chief

.5' .15 .5 .2 .12 .5 .1 .4 .12 .6
Thee, Si - on (.36) and the flow - ery brooks be - neath, (.34)

.2 .4 .3 .22 .4 .45 .22 .3 .4 .5
That wash thy hal¹ - lowed feet, (.65) and warb - ling flow, (.1)

.4 .22 .25 .22 .2
Night - ly I vis - it. (.5)

Lines 13-16. Reader I

.3 .1 .1 .2 .2 .5 .25 .32 .22 .4
Thee I re - vis - it now with bol - der wing. (.4)

.1 .42 .18 .25 .2 .55 .3 .4 .1 .6
Es - caped the Styg - ian Pool, (.4) though long de - tained

.25 .3 .2 .3 .25 .5 .25 .3 .1 .55
In that ob - scure so - journ, (.5) while in¹ my flight, (.2)

.2 .3 .1 .2 .2 .15 .1 .35 .3 .45
Through ut - ter and through mid - dle Dark - ness borne, (.4)

.2 .2 .1 .35
With oth - er notes etc.

A detailed examination of these selections indicates that there are twenty-three pauses; of these seventeen, or 74%, are preceded by the longest syllable of the group which the pause terminates. The average length of all stressed syllables in the selections exclusive of those preceding the pause is .35 seconds; for syllables preceding the pause it is .48 seconds.

¹ Doubtful division.

The selection also illustrates the point made that the word or syllable before the end of the line, even when there is no pause, shows the same preponderance of length as compared with other words or syllables in the same section; such, for example, are the words *sun*, *voice*, *more*, *chief*, *detained*. This same phenomenon occurs occasionally within the line at those points where there is no pause, but at which most readers do pause, that is, at logically possible points of division. In the selection given, such words are *void*, *grove*, *now*. The words which precede the end-pause are ordinarily longer than those which precede the internal pause. The reader will find these points illustrated further in the material given in Chapter IV.

Some evidence that the pause in itself exerts an influence in producing length, that is, that the lengthening cannot be wholly attributed to the relative importance of the word, is indicated by the length of the last syllables in trochaic verse (See p. 77). Here the light syllables are at times almost as long or quite as long as the stressed syllables.

The central point of interest for us in this matter of pause and syllabic length, is this: in Milton's blank verse the word or syllable before the pause is almost always long. Other excessively long words are found at possible points of pause, and only occasionally within a phrase. Excessive length seems to take the place of the pause in the mind of the reader. Milton, therefore, by making the end of the line and phrase frequently coincide, or by ending the line with a word so important as to be capable of being lengthened naturally, preserves in a subtle and unobtrusive way the line rhythm. The phrase rhythm is usually more distinctly felt than is the line rhythm, but may at times yield to it.

If any one will read the blank verse extracts given above, and the lyric verse given in Chapter IV, following the speaker of these lines in making certain words longer as he reads, he will see for himself the part these longer words play in creating a rhythmic swing; as for example,

I bring fresh showers for the thirsting flowers,
 From the seas and the streams;
 I bear light shade for the leaves when laid
 In their noon-day dreams.

To read over the poetry given in the chapter on Compensating Pause following the reader in the matter of shortening and lengthening syllables as they are indicated, is to obtain a clearer idea of the part quantity plays together with pause in the formation of rhythmical groups of which the unit is the phrase.

To illustrate the points made above, the lengths of the syllables in the readings of I, K, and M were measured for twenty-four lines of the *Paradise Lost*, Book I, lines 604-31, and the averages taken for the three readers. From these the accompanying graph was made (p. 48A). In this the heavy vertical lines represent the ends of lines. Crosses represent pauses. The numbers at the top of sections represent the number of readers who paused at the points indicated; beneath these is given the average length of the pause in tenth and one-hundredth seconds. The numbers at the side represent syllabic length, and at the bottom, the number of the syllable in the line.

It will be seen that the greatest heights in the graph accompany the lines with crosses which represent pauses. The six exceptions (not counting pauses made by one reader) are for the most part phrases ending with a light syllable. The graph also indicates that there are many ends of lines (represented by heavy vertical lines) with no pauses but with very long words or syllables preceding.

The psychologists have demonstrated that increased duration and increased intensity are usually associated; and, furthermore, that it is very difficult for the ear to detect the difference between the two. The question of intensity is a complicated one, and it is not my intention to go into the matter in detail, but I wish merely to suggest at this point that the end of the line, even when unpaused, may be made acoustically important by an increase in intensity. So many elements, both subjective and objective, enter into the problem of intensity, and so little work has been done upon it as a speech element that no exact results can be given at the present time.

Another phonetic characteristic very frequently associated with pause is a fall in pitch. This is especially evident in the records in words greatly prolonged. This fall in pitch occurs for certain readers at points where division is possible, but at which they make no pause. It is evident in such lines as,

The rising world of waters dark and deep,

in which the *ers* of *waters* shows at times both prolongation and fall in pitch; at other times it shows only a fall in pitch. It is evident in such lines as,

Yet not the more

Cease I to wander where the Muses haunt.

Both *more* and *der* of *wander* show a fall in pitch for most readers. In a sentence like "a man has power, a boy none," many readers would make no pause at the comma, but the ear would accept two units, which would be marked to some extent by a fall in pitch. The ear, without the testimony of the records, perceives such a fall in pitch accompanying a pause, or as a substitute for it; and also the gradual fall from unit to unit and from line to line to the low pitch before the last pause.

Another condition seems at times to mark off the end of the line, even though the line be run-on, and that is the occurrence of a pause, strongly marked, which is not a rest-pause. In the introduction the difficulty of determining at times whether or not a pause was a rest-pause, was pointed out. It is possible that the increased length of time involved in the formation of a particular consonant sound at the end of the line and for another which opens the following line, tends to mark off slightly the line as a unit, even when no rest-pause is made. Of such a character is the line

where the Muses haunt

Clear spring.

line 27.

The *t* of *haunt* clips the end of the line; and the silence necessary to form the *c* of *clear*¹ may easily be a little longer than for the same combination of letters in continuous prose. Lines 32 and 38 are similarly ended.

nor sometimes forget

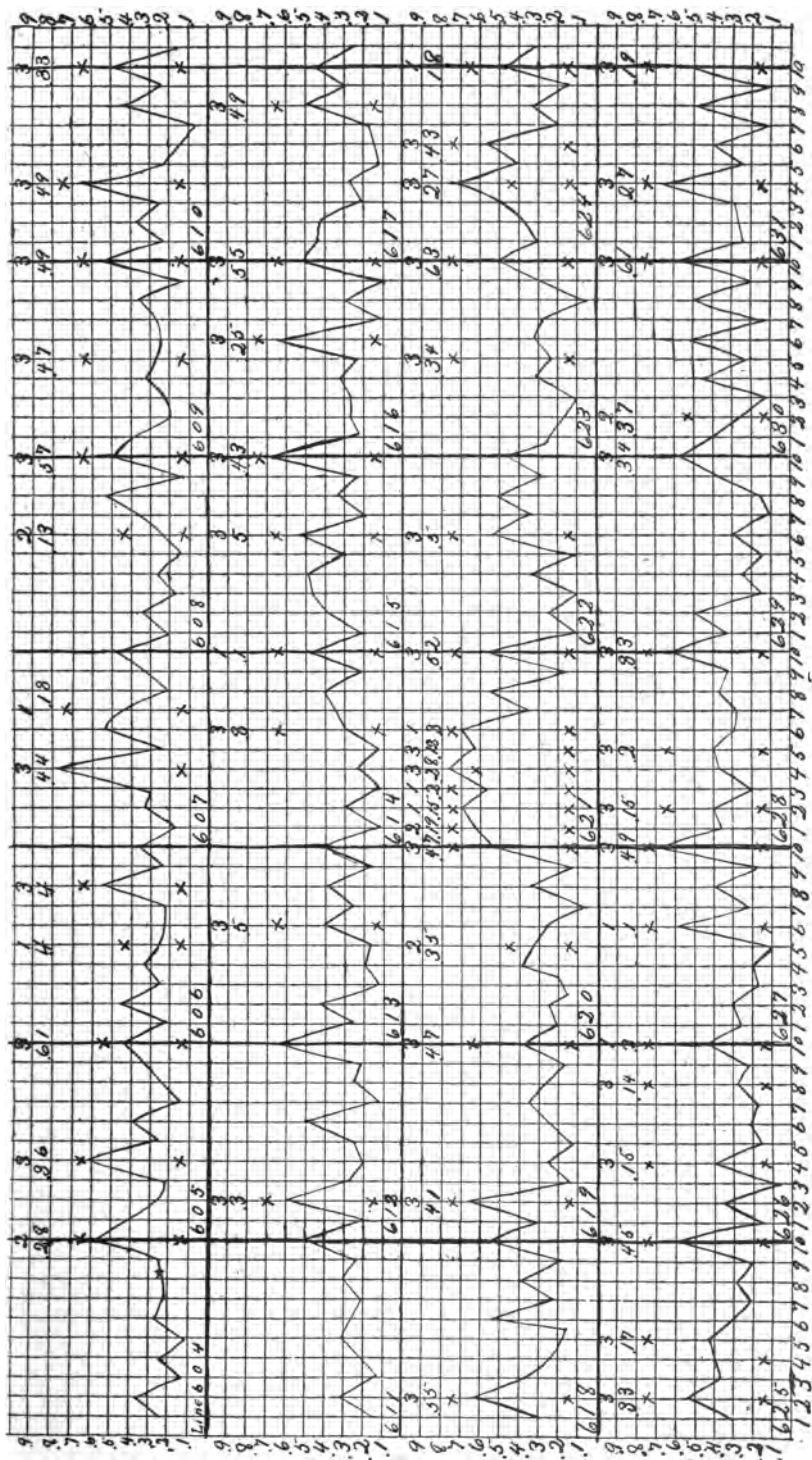
Those other two.

as the wakeful bird

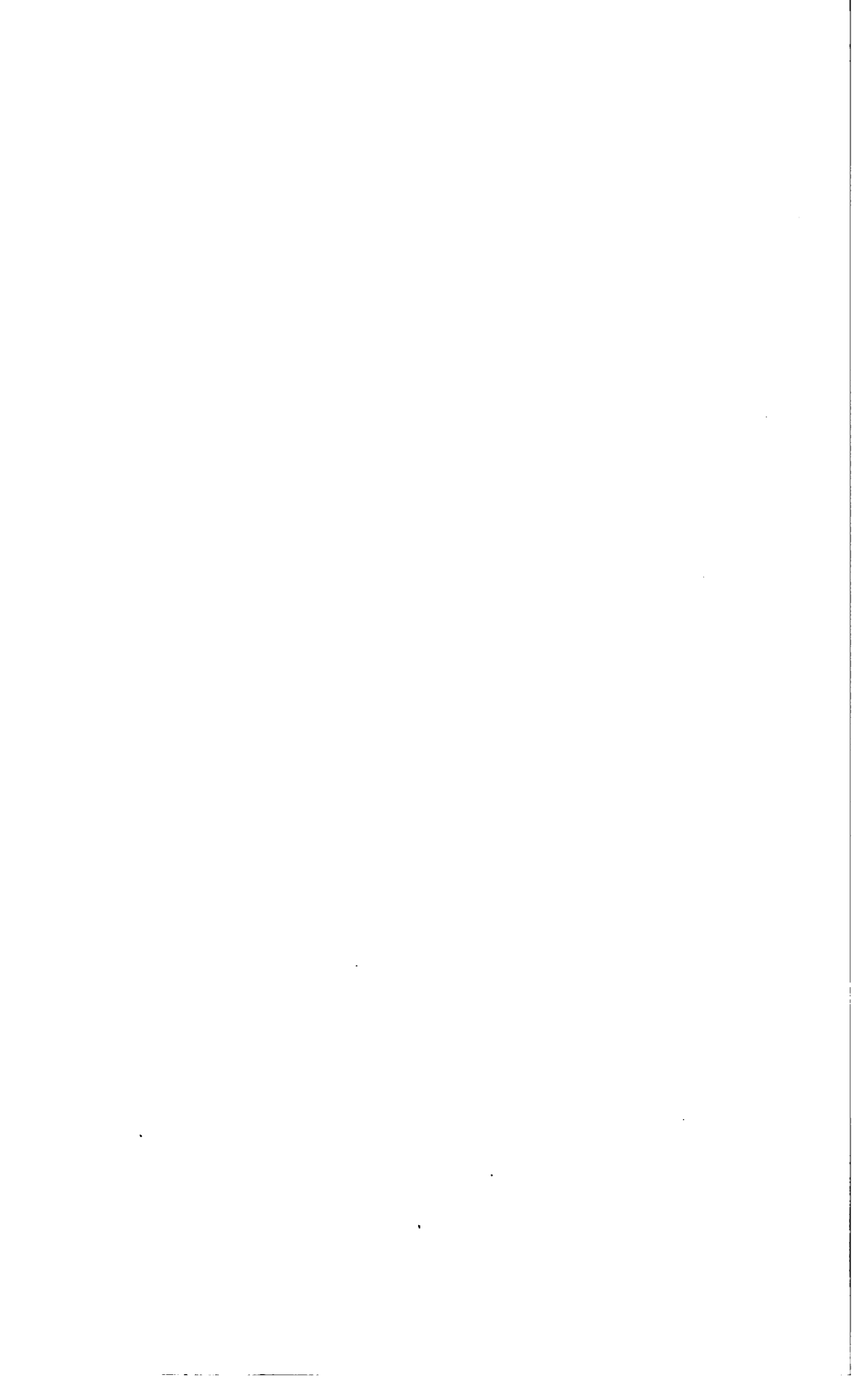
Sings darkling.

Scripture has suggested that the glottal catch may also serve as a means of marking off one sound-unit from another. What seemed to be evidences of the glottal catch appeared in the records.

¹ Readers who are less careful in their pronunciation will, of course, say *t'clear* instead of *clear*, but will nevertheless make a pause between the explosives.



Graph showing length of syllables in Milton's Paradise Lost, Book II, lines 604-631.



CHAPTER III

THE FORMATION OF SOUND UNITS

In the last chapter the number, position, and length of pauses were considered. It was found that pauses occur most frequently after the fourth and sixth syllables within the line, and occur more frequently at the end of the line than punctuation suggests. The length of the pause was found to vary in blank verse from a mere prolongation of a word to a break over a second long. This great variety in the length of the pause prevents monotony of cadence and makes it possible to organize the complex sound groups of phrase, line, sentence, and paragraph. The chief interest in pause, however, centers in the character of the phrases it marks off and the æsthetic value of these in poetry. These phrases, or sound-units, are complex musical chords made up of sounds varying in intensity, quantity, pitch, and tone. They may be deep-sounding, harsh, or lyrical; they may be short or long; they may follow each other in rhythmic sequence, or they may break up occasionally into discordant units. The chief points, however, which we shall consider here are the length and the rhythmical value of these sound-units.

The following table gives the average results for the different readers in the three divisions, the average for each division, and the general average for all divisions. In the different columns are given the readers, the average number of syllables in a group and the range in number for each reader, the average time for pronouncing the unit and the range in time, and finally the median and mode of the times of the sound-units.

The total number of sound-units considered is 840. The last unit was not counted. It will be seen from the table that the average number of sound-units made in the material is 168. The average number of syllables per unit is 6.3 with a range from one to twenty-one; the last, however, is unusual since sixteen is the largest number of syllables for all readers but one. The

[illegible]

average time for speaking the unit is 1.90¹ with a range in the averages for different readers from 1.54 to 2.36. The shortest unit made was .5 long and the longest was 5.3. Sound-units are seldom over four seconds long, and rarely this length. The average length of the sound-unit in lyric verse of various sorts (See page 62) was found to be 1.73, with a range from 1.61 to 2.28.

Since the last unit was not counted, the conclusions with reference to the number of units are the same as for the pause, and need not be repeated here. In order to compare the results of individuals it is necessary to study the figures of each division. In the first division the average amount of time for speaking the unit is 1.98 with a range in the averages for different speakers from 1.81 to 2.25, a span of .41. In the second division the average is the same as for the first, with a range for the different speakers from 1.74 to 2.36, a span of .62. In the third division the average is 1.76 with a range in the averages for the different readers from 1.54 to 2.01, a span of .53. From these results it is evident that the average time of the sound-unit varies for the different divisions by only .2 of a second, and for individuals by .6.

¹For purposes of comparison, records were made of prose both imaginative and unimaginative in character. The results are tentative and might easily be altered by a more extensive study. The results given include the average length of all pauses for blank verse, for imaginative, and for unimaginative prose. The average time for the sound-unit for each form is given, the percentage of silence to sound in the total process of speaking, the rate per syllable, the average number of syllables per unit, and the number of syllables studied. The prose, classified as imaginative included selections from Milton, Pater, Newman; that classified as unimaginative included selections from daily newspapers and magazines recounting current events.

	Average Time of Pause.	Average Time of Sound-unit.	% of Silence.	Rate per Syllable Without Pause.	Aver. No. of Syllables per Unit.	No. of Syllables Studied.
Blank verse .....	.45	1.90	19%	.30	6.2	5500.
Imaginative prose .....	.50	1.97	20%	.25	7.9	870
Unimaginative prose .....	.45	2.91	13%	.20	14.	756.

LENGTH OF SOUND-UNITS WITH REFERENCE TO SYLLABIC CONTENT

Of more importance for rhythmical considerations is the proportion of short and long units and the length of units with reference to the number of syllables they contain. The following table gives the number of syllables in a unit, the frequency of occurrence, the average time of the unit, the range of time, the length of the pause which follows the unit, and the range in the time of the pause.

TABLE VII

No. of Syllables in a Sound-unit.	Frequency of Occurrence.	Aver. Time of Unit.	Range in Time.	Aver. Length of Pause Following Unit.	Range in Time of Pause Following Unit.
1	16	.61	.5 - .95	.23	.07- .4
2	54	.76	.41-1.9	.35	.07- .4
3	60	1.06	.5 -2.6	.37	.07- .8
4	180	1.41	.58-2.6	.42	.1 -1.
5	69	1.44	.95-2.4	.45	.1 - .85
6	177	1.90	1.05-3.25	.55	.06-1.1
7	31	2.25	1.55-4.9	.52	.08-1.25
8	88	2.48	1.3 -3.8	.52	.1 - .8
9	26	2.78	1.62-3.8	.36	.1 - .8
10	97	2.89	1.2 -4.2	.53	.1 -1.3
11	2	2.36	2.1 -2.62	.33	.2 - .4
12	13	3.86	2.8 -5.3	.47	.1 - .8
13	2	3.3	2.7 -4.	.36	.3 - .5
14	15	3.72	2.8 -4.9	.55	.18- .8
15	2	3.9	3.6 -4.3	.45	.4 - .5
16	5	4.07	3.6 -5.1	.6	.4 - .7
18	1	5.		.2	
20	1	3.7		.7	
21	1	4.		.1	

From the table we see that the four-, six-, eight-, and ten-syllabled groups occur most frequently. The four- and six-syllabled groups occur over twice as many times as all the other

groups together. Sixteen is undoubtedly a high number for the one-syllabled group; this number is due to the abnormal line in the first selection, the *Rocks, lakes, caves* line. The selection from Book III has only one group consisting of one syllable. The very long groups occur for one reader only, a person who reads very rapidly. The eleven-, thirteen-, and fifteen-syllabled groups may be regarded as erratic, or, more probably, as groups broken up, in the consciousness of the reader, into smaller units by the great lengthening of a word at places where other readers pause. All these long groups show such a lengthening of words at pause-places.

Since the four-, six-, eight-, ten-syllabled groups are the ones which predominate in Milton's blank verse, it occurred to me that it might be of interest to determine what groups would appear most frequently in *L'Allegro*. Records were made, therefore, of the last eighteen lines of this poem, with P and I as readers. (The numbers in the material indicate the number of times the readers paused and the places at which they paused.)

And ever against eating cares, (2)
Lap me in soft Lydian airs, (2)
Married to immortal verse (2)
Such as the meeting soul may pierce (2)
In notes, with many a winding bout (2)
Of linked sweetness long drawn out, (2)
With wanton heed, (2) and giddy cunning, (2)
The melting voice through mazes running; (2)
Untwisting all the chains that tie
The hidden soul of harmony; (2)
That Orpheus' self may heave his head (2)
From golden slumber (1) on a bed (1)
Of heaped Elysian flowers, (2) and hear
Such strains (2) as would have won the ear
Of Pluto, (2) to have quite set free (1)
His half re-gained Eurydice. (2)
These delights, (2) if thou canst give, (2)
Mirth with thee, (1) I mean to live. (2)

The punctuation is that of the Cambridge reprint of Milton's MS. It will be seen that there are ten eight-syllabled groups and six four-syllabled groups; i. e., sixteen of the twenty-three groups made are eight and four syllables long. This number is undoubtedly somewhat increased for the ear by the breaking up

of the longer groups by other means than by pause,¹ a point already considered. Basing a conclusion upon this slight test of enjambed octosyllabic verse, one sees that here the predominating units are eight and four, while in blank verse they are four, six, eight, and ten. In other forms also the grouping undoubtedly would differ; but for all sorts of verse, the group forms would in general be those found in the blank verse, only for lyric verse a typical group would probably be more frequently repeated than are the four- and six-syllabled groups² characteristic of the *Paradise Lost*.

The next point to consider is the average time in which the different groups are spoken. We see from the table that there is a steady increase in time until we reach the eleven-syllabled group, after which the times become irregular. As far as the averages indicate, the shorter groups are spoken in a relatively longer time, and the longer ones are spoken in a relatively shorter time. Nevertheless the ranges in time given for the speaking of units consisting of the same number of syllables indicate that the time for speaking any one group is exceedingly flexible; for instance, the time required for speaking a unit of three syllables may be as great as that required for speaking five; and speaking ten may require no more time than speaking three. Some readers speak the same units with a more uniform rate than others; but all readers show striking variations. This statement may be made more definite by the following table, which gives for individual readers the average time for speaking the four-, six- and ten-syllabled groups, the frequency of occurrence of these groups, and the range in time for each group. More

¹ Bed, free, and thee were all made long by the reader who did not pause after these words. Tie and ear were very long for both readers.

² For the lyric verse studied the groups range from one to twelve syllables and appear with the frequency indicated by the following figures:

1	2	3	4	5	6	7	8	9	10	11	12
13	25	15	35	19	14	14	9	7	6	1	2

In verse of this sort the four-syllabled group occurs most frequently. The longer groups do not occur so frequently as in blank verse. These results are for verse of various sorts; in any given poem undoubtedly a characteristic syllabic unit would appear with more frequency. The main point of interest is that the largest number of units are those composed of two, four, and five syllables. The number of one-syllabled groups is large owing to the fact that the poems were selected for the purpose of studying compensating pause, and therefore contain more groups of this sort than would normally be found in the same amount of material.

striking differences are shown in the less frequently occurring units, but these given are selected simply because they do occur more frequently than the others. An examination of the results indicates that language is an exceedingly flexible medium capable of being extended and compressed, like an accordin, in harmony with an ever-varying thought and emotional content.

TABLE VIII

Giving for the four-, six-, and ten-syllabled units, the frequency of occurrence, the average time, and the range in time for individual reader in each of the three divisions of the material studied.

Reader.	Units of Four Syllables.			Units of Six Syllables.			Units of Ten Syllables.		
	Aver. Time of Unit.	Range in Time.	No. of Units.	Aver. time of Unit.	Range in Time.	No. of Units.	Aver. Time of Unit.	Range in Time.	No. of Units.
Division I									
M	1.34	.58-2.6	16	1.55	1.3 -2.	14	2.25	2.1 -3.2	9
I	1.23	.8 -1.75	18	1.72	1.3 -2.8	16	2.9	2.4 -3.28	7
Ho	1.58	.95-2.4	22	1.93	1.6 -2.72	17	2.8	1.2 -3.6	8
K	1.78	.9 -2.42	16	2.81	1.3 -2.9	19	3.6	2.6 -5.	9
V	1.23	1. -2.25	22	2.28	1.4 -3.25	22	3.7	3.3 -4.2	4
Division II									
M	1.17	.9 -1.4	7	1.64	1.4 -2.25	8	2.44	2. -2.9	9
P	1.48	1.2 -1.65	10	1.72	1.2 -2.25	12	2.9	2.4 -3.8	7
H	1.6	1.3 -2.	11	2.17	1.35-2.8	10	2.97	2.1 -4.	9
A	1.74	1.3 -2.5	12	2.3	1.8 -2.8	13	2.88	2.1 -3.32	4
Pi	1.25	1. -1.92	4	1.44	1.2 -1.6	5	2.28	1.8 -2.9	8
Division III									
M	1.25	1.1 -1.5	9	1.64	1.5 -1.9	8	2.58	1.9 -3.3	6
P	1.21	.65-1.5	13	1.81	1.25-1.9	11	2.6	2.1 -2.9	3
B	1.44	1.4 -2.4	5	1.82	1.75-2.6	6	2.4	2.1 -2.6	7
T	1.9	1.4 -2.4	3	2.03	1.34-2.2	8	3.34	2.85-4.	4
I	1.37	1. -1.65	12	1.68	1.3 -2.	8	2.6	2.5 -2.8	3

LENGTH OF SOUND-UNIT AND LENGTH OF PAUSE

In the fifth column of Table VII is given the average length of the pause which follows a given unit; and in the sixth column is given the range in the length of the pause. Thus, after a sound-unit containing one syllable the average length of the pause is .23, and the range is from .07 to .4. The purpose in making these calculations was to determine whether or not there was any connection between the length of the unit and the length of the pause. The table shows a steady increase in the length of the pause from the one-syllabled group to the seven-syllabled group. From the seven- to the eleven-syllabled group, with the exception of the nine-syllabled group, the averages are about the same, being .52. For the other groups the lengths of the pause seem non-significant, especially those following the very long units; but these units are in themselves erratic. It is evident from the table that the shortest pauses follow the units consisting of one, two, and three syllables. The longest average pauses follow units over four syllables long; but from the ranges it is seen that the absolutely longest pauses do not follow the longest groups. The length of the pause is, as one would naturally suppose, a logical and not a physical matter. It is interesting to note that up to the eleven-syllabled group the longest average pause is after the six-syllabled group and the next longest average is after the ten-syllabled group.

The next question to be considered is the æsthetic value of the sound-unit in English poetry. Are these units sufficiently short and sufficiently uniform to produce a perceptible rhythm?

SOUND-UNITS AND RHYTHM

The question with reference to free blank verse is whether such rhythm as it possesses is purely metrical, as some persons assert, or whether one finds here a phrase-rhythm which, although not like that of more formal poetry, secured there by the line or half-line, is nevertheless a rhythm which can be perceived. The psychologists have experimented at various times with the rhythmizing instinct in an effort to determine the number of impulses which a succession of groups may contain and be rhythmically perceived, and also the amount of variation which may be introduced within the group. Since the experiments have for the most part been done with telegraphic clicks, or taps, or flashes of light, and with elements other than lan-

guage, I shall not go into a detailed review of the work; for although the results may be true for language, they have not been proved, but merely inferred. Since so many elements enter into the language problem, such as pitch, duration, spacing, and intensity, one cannot say precisely how different the results are for spoken language as compared with those for mechanical elements. The only possible way to test the matter is to examine what happens in rhythmic language; the difficulty lies in determining whether or not certain forms of language, such as poetical prose and prose-poetry, have a clearly perceived phrase-rhythm. Persons to whom poetry is read are so concerned with the meaning that it is difficult to isolate the problem of rhythm in language and obtain normal results. Although, as has been said, the rhythmizing instinct may not act in precisely the same way for language as for other elements, it is nevertheless of interest to note briefly what experimental psychology has discovered as to how long in time groups of various elements may be and still be rhythmic.

Bolton¹ says, "taking all the forms of grouping together, the average time is taken to indicate the normal period of a wave of attention which does not exceed greatly one second." He gives the limit for rhythmical grouping as 1.58 seconds. Dietze² found in his experiments that grouping impressions was impossible after the period had reached 4.25 seconds. Titchener³ states that the average length is 3.5 seconds. Titchener says that verse rhythm is perceived to the extent of six feet, but the seven-foot line falls to pieces. Meumann⁴ gives 4.25 as the extreme limit. Limits lying between .4 and .5 seconds and 1 and 2 seconds have been given by Smith,⁵ and others.

An interesting comparison of the length of spans between pauses in poetry and in work is furnished by M. K. Smith in *Rhythmus und Arbeit* in the volume cited above. This investigator says that the usual rhythmic period of a single worker making blows with a hammer is from two to four seconds; beyond

¹ Bolton, *Rhythm. Am. Jour. Psych.* VI. 145-238.

² Dietze, *Untersuchungen über den Umfang des Bewusstseins bei regelmässig aufeinanderfolgenden Schalleindrücken. Philos. Studien*, 1885, II, 383.

³ Titchener, *A Primer of Psychology*.

⁴ Meumann, *Der Rhythmus des gesprochenen Verses. Philos. Studien* X, 1894.

⁵ Smith, *Philos. Studien*, 1900, XVI, 282.

this the sense of rhythm disappears. MacDougall¹ declares that eight or ten units can be perceived in a group. The faster the rate, the larger is the number of impressions which enter into each group.

According to most of the authorities cited above the sound-unit is not too long to be rhythmized. The psychologists have also demonstrated that rhythm does not depend upon equality of successive time-intervals; these intervals need be only approximately equal, since the ear accepts intervals as fairly equal which are not so. Meumann² has shown that intervals as long as four or five seconds are very inaccurately estimated. Smith³ says absolute regularity in the time of movement or in time intervals is not necessary for the perception of rhythm.

The length in time of the sound-unit which makes up Milton's blank verse, then, judged from the general results of psychological experiments done with elements mechanical in nature, seems to indicate that the phrases, which we have called sound-units, are capable of making a distinctly felt rhythm. Any conclusions in the matter, as far as language is concerned, are largely subjective; but the fact that poetry is characterized by groups of syllables which keep, in general, within well-defined limits as to syllabic content and time, indicates that this uniformity has rhythmical value, just as the regular arrangement of stressed syllables has rhythmical value. And the variation of the length of the sound-unit in blank verse is analogous to the variation in the length of the foot,—a point discussed in Chapter IV under the general subject of compensating pause.

To sum up the conditions which characterize the phrase in Milton's blank verse, both from the point of view of the number of syllables in the unit and the time of speaking it, we find that the average time is 1.90 seconds; that is, approximately the typical time which, most frequently repeated by the four- and six-syllabled group, and other closely related groups, produces an undertone of uniformity. From this type there is constant variation in phrases as to syllabic content and time of speaking, but the time lies in general between .82 seconds, the average for the two-syllabled group, and 2.8 seconds, the average for the ten-syllabled group. Extremes in time and unusual groups with

¹ Robert MacDougall. *Structure of Simple Rhythm Forms*. Harvard Psychological Studies, I, 309.

² Meumann, *Philos. Studien*, Vol. X, p. 404.

³ *Op. cit.*

reference to syllabic content, give variety and flexibility to the verse, and afford the varied cadences which, because of their rarity and appropriateness, are often very effective.

But we must remember that, on the one hand, slight pauses may occur and be recorded by the instrument, which do not in reality break up a phrase for the ear; and, on the other hand, other phenomena such as have already been described, may take the place of pauses in breaking up longer sound-units into shorter ones.

Let us consider briefly the case of the very short phrases occasioned by slight pauses occurring within a larger group felt to be a unit in itself. Within any line of poetry in lyric verse, verse in which the line is felt as a distinct unit on account of its shortness, slight pauses may occur occasioned by the meaning; thus there may be a pause after stars in the line,

The stars with deep amaze

and especially such a pause may occur in reading the line from modern editions which place a comma after stars.

In the second line from the following modern poem, two pauses might occur.

The Little Poor Man walked the world,
(Laugh, laugh, my scars)
Hunger and thirst, and lack and lost,
Beckoned to him like stars.

The Wolf of Gubbio. Josephine Preston Peabody.

The unit would, nevertheless, be the whole line; the pause plays a prominent part in checking the metre, but does not break up the larger rhythm of the line. The same observation holds true for blank verse in which the sound-groups may be thought of as corresponding to the short lines of lyric verse. "Hail, holy light," would be considered a unit even if a pause were placed after Hail. In the phrase "May I express thee unblamed?" two readers paused after thee for one-tenth of a second; but the rhythmic unit undoubtedly for them was the whole phrase, after which they paused, the one .6, the other .3 of a second. The entire phrase, "chief Thee, Sion," is probably accepted as a rhythmic unit even by those readers who would pause after both chief and Thee. As a matter of fact the two readers who paused after chief omitted the pause after Thee. The pauses that occur after I in "So were I equalled with them in renown," and especially after prophets in "prophets old," were introduced either to give emphasis or to make the words stand out distinctly; one

reader said he separated prophets and old in order not to run the s into the following vowel. Some of these pauses are so very slight that they may not be perceptible to the ear, especially when the mind is concerned with the meaning, or they may not be rest pauses at all. R. H. Stetson¹ found in dealing with meaningless syllables that lags introduced in the first part of the verse were usually not detected, but when lags of identical length were introduced in the latter part they were detected. This statement might hold true for normal language provided the pause in the first part of the verse was slight. Units which have within themselves slight pauses may, then, be regarded for rhythmical purposes as practically unbroken even when the ear perceives the pause. It is this sort of pause which writers on prosody have in mind when they speak of the grammatical pause as opposed to the rhythmical, but such a distinction is misleading, since no pause occurs without some logical justification. Short groups may, of course, be followed by long pauses, and may constitute a unit; but the point which I am making here is that a short group of syllables followed by a short pause is probably not accepted by the ear as breaking up a longer phrase rhythm.

THE LENGTH OF THE LINE IN BLANK VERSE AND IN LYRIC VERSE

The line in poetry may be the equivalent of a sound-unit, or may be composed of two or more sound-units. In any case it is a rhythmical unit which is clearly marked in lyric verse and in formal blank verse, and less clearly marked in more freely organized blank verse like Milton's. Nevertheless even in blank verse of Milton's sort, as has been pointed out, the line is usually maintained, although often unobtrusively so by means already noted. Since it is a rhythmical unit, I am giving below a table which shows the length of the line in blank verse and also in lyrical verse.

In estimating the length of lines I have given the entire length, counting the line from the beginning to the end of the sound for each line whether or not there is an end-pause and including all internal pauses. I have given also the length of the line minus the internal pauses. The ranges are given in both cases. In neither case are end-pauses counted.

¹ Op. cit., p. 40.

TABLE IX

Poem.	Average Length of Line with Internal Pause Included.	Range in Length.	Average Length of Line Without the Internal Pause.	Range in Length.
Paradise Lost				
20 lines	3.30	2.20-4.25	2.90	2.20-3.72
Break, Break, Break ¹	3.27	2.66-4.	2.66	1.6-3.3
Bugle Song	3.63	3.02-4.41	3.34	2.77-3.99
Forsaken Merman	2.83	1.83-4.19	2.63	1.82-3.73
Cavalier Tunes	3.38	2.6-4.65	3.22	2.70-4.15
The Cloud	2.24	1.50-3.08	2.22	1.50-3.00
Sing a Song of Sixpence..	1.99	1.53-2.11	1.51	1.12-1.77
Christabel (ten lines)....	2.99	1.92-4.38	2.71	1.42-4.38
Average for lyric verse...	2.90	1.50-4.65	2.61	1.12-4.38

If the pause is excluded the average length of the line for the lyric verse studied is .29 shorter than for blank verse, and the ranges lie within approximately the same limits. If the pauses are counted the difference between the two is .4, the excess being for blank verse. Three of the selections studied have lines which average about the same length as those of the blank verse. It is of interest to note that the times of the line-unit also come within the limit set by most psychologists as necessary for the perception of a rhythmic series.

GENERAL RESULTS FOR LYRIC POETRY

At various points in the dissertation reference has been made to lyric poetry. Most of the material studied appears in the chapter on compensating pause on page 64. The results are here presented for the purpose of comparing blank verse and lyrical verse with reference to pause, sound-units, and the number of syllables per unit.

¹The amount of material measured may be found by consulting Chapter IV.

TABLE X

	Reader.	Aver. Length of Internal Pause.	Aver. Length of End Pause.	Aver. Length of Sound-unit.	Aver. No. of Syllables per Sound-unit.	Total No. of Syllables Studied.
Cavalier Tunes	Ka	.31	.64	1.80	6.8	85
Cavalier Tunes	I	.15	.53	1.62	6.7	27
The Forsaken Merman.....	A	.24	.58	1.38	4.4	70
Christabel	A	.30	.51	1.61	5.8	180
Bugle Song	Ka	.35	.66	1.35	3.4	175
The Cloud	I	.18	.47	1.89	6.	97
Break, Break Break	K	.33	.53	1.75	4.7	59
Sing a Song of Sixpence.....	I		.32	1.82	6.9	69
The Lady of Shalott	P	.4	.54	2.28	7.2	65
Average for all selections....	—	.28	.53	1.73	5.8	

The table indicates that the internal pause is about one-half the length of the end pause; in blank verse the two were approximately the same length. The end-pause in most lyric verse is longer than the end-pause in blank verse. These two facts, the shortness of the internal pause and the greater length of the end-pause, make the line in lyric verse more prominent than it is in blank verse.

The average length of the sound-unit is .17 shorter in lyric verse than is the average length in blank verse; nevertheless about one-half of the averages given for the different poems approximate the length of the average for blank verse.

The average number of syllables per unit is slightly less than for blank verse, the average number in blank verse being 5.9; it is of interest and significant that in both forms the average number of syllables in a group is practically the same.

Individual poems show considerable variation in all particulars that have been mentioned; but sections of the *Paradise Lost* show the same variations not only for different readers but also for the same reader reading different sections. With the ex-

ception of the length of the internal pause lyric verse does not differ in the general results obtained from the blank verse studied.

In this chapter we have found that the sound-unit in blank verse averages 1.90 seconds in length, with a range from .42 to 5.3. The average number of syllables per unit is 6.3 with a range from one to twenty-one. The most frequently occurring units are the four-, six-, eight-, and ten-syllabled groups. The length of the groups falls within the time established by most psychologists as necessary to create a rhythmic series. Sound-units, however, vary greatly in length; units of the same syllabic content also vary considerably in length; but sound-units usually fall within the limit of from two to twelve or fourteen syllables, and in time, within the limit of from .85 to 4 seconds. Since in blank verse the end-pause and the internal pause are about the same length, the sound-unit or phrase has greater rhythmical importance than the line; on the contrary, in lyric verse the end-pause is twice as long as the internal, which fact tends to make the line of greater rhythmic importance than the phrase. The sound-unit in its great variety of length is like the metrical unit or foot,—a point which will be discussed in the next chapter on Compensating Pause.

CHAPTER IV

COMPENSATING PAUSE

The function of pause is, as we have seen, the division of language into sound-units which are unified by meaning. When pause divides these units into approximately equal lengths it creates a perceptible rhythm. Metre creates a different rhythm by adjusting the phonic elements of language to a definite pattern. Thus, there are two rhythms, one arising from the adjustment of phrases to a more or less definite pattern, and another arising from the adjustment of the various qualities of sound to a pattern. The two fall together when the end of the phrase and the end of the foot coincide, as in the line,

And swims, or sinks, or wades, or creeps, or flies.

P. L. II, 950

The light syllable, however, may be omitted and a rhythm created in which phrase and foot likewise coincide, but the pause in this case plays a metrical part. Of such a character are the oft-quoted lines of Tennyson's "Break, break, break," and Arnold's "Down, down, down." Frequently a light syllable is dropped, not uniformly, as in these lines, but sporadically, as in Milton's *L'Allegro*, in the line,

Mirth, with thee I mean to live.

In these lines, plainly, a pause occurs where usually there is a light syllable. Such a pause has been called the compensating pause, on the theory that metrical units are approximately equal in length, and that the pause fills out the required time. Thus the lack of time is accounted for, or made up; but what is done with the extra time in the line "And swims, or sinks, or wades, or creeps, or flies," we are not told; and how it is disposed of in such lines as "Rocks, caves, lakes, fens, bogs, dens and shades of death," it is still more difficult to determine. In all these cases, from whatever point of view the matter is considered, a pause is clearly marked. But the theory of compensating pause is carried further and is said to make up everywhere the loss of

time occasioned by missing syllables. In iambic metres like that of *L'Allegro*, pause makes up the time in such lines as,

Lap me in soft Lydian airs, and
Married to immortal verse.

In anapaestic metres with iambic substitutions the missing syllables are supposed to be made up by pause. Omond,¹ who has developed the theory most completely, says that it makes no difference whether the pause is on the word or after it; no pause and increased duration serve the same purpose. Here again one is faced with the problem of what is done with the extra syllables, especially when in a trochaic metre these stand at the opening of a line, with the preceding line carrying its full share. As a matter of fact the compensating pause rests upon an untenable theory. Metrical units are not at times even approximately equal in length. Our time perception is not disturbed by decided inequalities, and does not bother about a few syllables more or less. This statement does not contradict the theory of the perception of approximately equal time intervals as a fundamental requirement for rhythm, but merely points out that the intervals may vary greatly in duration without destroying the sense of rhythm. Psychologists have demonstrated that groups composed of the same number of units may be varied considerably in length, and also that the number of units within the groups may be varied without disturbing the listener's sense of rhythm. The ear may regard units as possessing the same duration although no such strict equality, in fact, exists. It is not necessary, then, to interpret shortage of syllables as made up by compensating pauses. Variety may be introduced into the metre both by adding and by subtracting syllables to a certain degree without disturbing the rhythm. A good deal of the free verse from Coleridge's *Christabel*, not to mention Anglo-Saxon verse and much of the Middle English verse, to the very modern verse of Whitman and the Imagists is clearly formed on the principle that both the metrical and phrase-unit may be considerably varied in time and content without doing injury to the rhythm. Nevertheless to be verse at all, it has also to obey certain principles lying in the nature of the perception of rhythm.

In order to bring out clearly this matter of pause and metre, the following selections are given with the feet and syllables

¹ T. S. Omond, *Study of Metre*.

measured. In dividing words into syllables, I have followed usually the conventional mode, although there is often a discrepancy between this and the actual division made in speech; for example, summer phonetically is sum-er, and must be so measured. Powers has two syllables, but I count it as one, since it is usually so regarded in poetry. The word order should be divided ord-er since the accented syllable carries the final consonant with it. If we say, ordér, then the d goes with the last syllable. In general, the conventional and phonetic divisions are not so far apart as to affect results. The problem of syllabification is under investigation now at the University of Michigan.

In the division of words into syllables and in separating words from each other as they appear in the records, the points of division are ordinarily clear; but when the division is between two voiced sounds, one sound sometimes runs into another in such a way that it is not possible to mark precisely the end of one sound and the beginning of another. The division of such words as rather and hallowed is difficult to determine. The end of all nasal sounds is readily shown on the line which records nasal tones; and often the change in the shape of the wave makes the point of division clear.

The selection given below was read by K to line 612, by I to line 622, and by M to the close. The pauses are enclosed in parentheses. The selection is from *Paradise Lost*, Book II, 604-628.

.4 .4 .15 .3 .1 .2 .3 .3 .25 .8
604 They fer - ry o¹ - ver this Le - the¹ - an sound (.4)

.4 .3 .22 .6 .15 .3 .18 .2 .4 .45
605 Both to and fro, (.18) their sor - row to aug - ment, (.6)

.2 .5 .3 .4 .3 .3 .22 .7
606 And wish and strug - gle, (.4) as they pass, (.46)

.3 .4
to reach

.2 .38 .34 .84 .28 .4 .65 .6
607 The tempt - ing stream, (.46) with one small drop (.18)

.3 .4
to lose

- .2 .4 .2 .3 .2 .28 .48 .6 .2 .62
 608 In sweet for-get-ful-ness all pain and woe, (.7)
 .48 .22 .3 .4 .3 .35 .35 .44 .12 .7
 609 All in one mo-ment, (.5) and so near the brink; (.7)
 .26 .48 .35 .8 .25 .25 .15 .55
 610 But Fate with-stands, (.6) and, to¹ op-pose the
 .3 .6
 at-tempt, (.55)
 .15 .38 .12 .2 .4 .4 .2 .34 .24 .7
 611 Me-du-sa with Gor-go-nian ter-ror guards
 .12 .55 .2 .2 .18 .5 .12 .26 .25 .68
 612 The ford, (.3) and of it-self the wa-ter flies
 .14 .48 .15 .2 .2 .4 .2 .4 .14 .4
 613 All taste of liv-ing wight, (.4) as once it fled
 .14 .35 .12 .28 .1 .32 .3 .3 .2 .52
 614 The lip of Tan-tal-us. (.7) Thus rov¹-ing on (.1)
 .22 .38 .38 .4 .24 .45 .2 .32 .22
 615 In con-fused march for-lorn, (.4) the ad-ven-turous
 .6
 bands, (.52)
 .2 .26 .3 .3 .28 .6 .18 .4
 616 With shud-dering hor-ror pale, (.15) and eyes
 .08 .54
 a-ghost, (.4)
 .3 .37 .18 .18 .08 .1 .15 .7 .28 .38
 617 Viewed first their lam-en-ta-ble lot, (.74) and found
 .18 .5 .3 .25 .18 .12 .52 .2 .4 .18 .38
 618 No rest. (.3) Through man-y a dark and drear-y vale
 .2 .6 .12 .28 .12 .15 .28 .26
 619 They passed, (.3) and man-y a re-gion
 .25 .15 .32
 dol-o-rous, (.3)

¹Division doubtful.

- .22 .24 .1 .15 .35 .3 .3 .12 .1 .42 .3 .52
 620 O'er man - y a froz - en, man - y a fier - y Alp. (.3)
- .5 .6 .5 .65 .5
 621 Rocks, (.3) caves, (.15) lakes, (.2) fens, (.2) bogs, (.2)
- .7 .2 .44 .1 .52
 dens, (.3) and shades of death (.55)
- .2 .2 .1 .4 .15 .5 .3 .48 .2 .4
 622 A¹ u - ni - verse of death, (.6) which God by curse
- .2 .15 .1.28 .2 .2 .24 .15 .2 .18 .5
 623 Cre¹ - at - ed e¹ - vil, (.4) for e¹ - vil¹ on - ly good; (.8)
- .3 .3 .4 .75 .3 .52 .18 .29 .18
 624 Where all life dies, (.2) death lives, (.6) and Na - ture
- .4
 breeds.
- .28 .5 .26 .3 .42 .28 .2 .26 .2
 625 Per - verse, (.2) all mon - strous, (.1) all pro - dig - ious
- .6
 things, (.5)
- .15 .25 .1 .08 .48 .15 .12 .2 .24
 626 A - bom - i - na - ble, (.2) in - ut - ter - able, (.6)
- .24 .35
 and worse
- .26 .32 .18 .18 .2 .46 .2 .32 .4 .8
 627 Than fa - bles yet have feigned or fear con - ceived. (.5)
- .32 .32 .2 .32 .34 .2 .28 .4 .28
 628 Gor - gons, (.15) and Hy - dras, (.1) and Chi - mae - ras
- .5
 dire.

Results showing the length of the feet in the selections from *Paradise Lost* are given below. The lengths of the pauses are given enclosed in oblique lines in the positions in which they occur. If the pause occurs in the midst of a foot, its length is given at the end of the foot in which it occurs.

¹ Doubtful division.

Reader K

604	.8	.45	.3	.6	1.05/.4/
605	.7	.82/.18/	.45	.38	.85/.6/
606	.7	.7	.6 /.4/	.92/.46/	.7
607	.58	1.18/.46/	.68	1.25/.18/	.7
608	.6	.5	.48	1.08	.82/.7/
609	.7	.7	.65/.5/	.79	.82/.7/
610	.74	1.15/.6/	.5	.7	.9 /.55/
611	.53	.32	.8	.54	.94
Aver. ..	.67	.63	.5	.78	.85

Reader I

612	.67/.3/	.4	.68	.38	.93
613	.62	.35	.6 /.4/	.6	.54
614	.49	.4	.42/.7/	.6	.72/.1/
615	.6	.78	.69/.4/	.52	.82/.52/
616	.46	.6	.88/.15/	.58	.62/.4/
617	.67	.36	.18	.85/.74/	.66
618	.68/.3/	.55	.82	.6	.56
619	.8 /.3/	.4	.55	.51	.47/.3/
620	.46	.6	.6	.64	.82/.3/
621	1.1 /.15/ ¹	1.15/.2/	1.2 /.3/	.64	.62/.55/
Aver. ..	.66	.56	.66	.59	.68

Reader M

622	.4	.5	.65/.6/	.78	.6
623	.35	.38	.64/.4/	.35	.68/.8/
624	.6	1.15/.2/	.82/.6/	.47	.58
625	.78/.2/	.56	.7 /.1/	.46	.8 /.5/
626	.4	.66/.2/	.27	.44/.6/	.59
627	.58	.36	.66	.52	1.2 /.5/
628	.64/.15/	.52	.54/.1/	.68	.78
Aver. ..	.54	.59	.61	.53	.75

Aver. for the three readers..... .61 .63 .63 .63 .76

Aver. length of foot for each reader..... K² I M
.73 .63 .6

Range3-1.25 .18-1.2 .27-1.2

Aver. for all readers, .65. Range, .18-1.25.

¹The pauses between words in this line are not included.

²K reads slowly. It is probable that .6 more nearly represents the time for speaking the iambic foot.

From these results it is evident that there is a good deal of difference in time among the feet. They range from .18 to 1.25 seconds long. The average length is .65. The last foot has the longest average time. In certain lines the length of the feet will be approximately equal as in line 609; but in others there is such a diversity that one foot may be twice or three times as long as another in the same line. It will be seen that adding pauses to the feet does not equalize the time; such an addition renders them generally even more irregular in time.

Since the feet of blank verse may be regarded as not possessing the same nice adjustments in time as those of lyric verse, I give the results for the following poem, with the length of the syllables indicated. The last two lines of each stanza were omitted as not offering a pure iambic metre.

Reader Ka

.15 .58 .2 .8 .3 .38 .2 .76
The splen - dor falls / .2 / on cast - le walls / .5 /

.26 .3 .15 .38 .2 .5 .2 .5 .28
And snow - y sum - mits / .5 / old in stor - y; / .8 /

.12 .6 .4 .6 .09 .5 .08 .5
The long light shakes / .18 / a - cross the lakes, / .52 /

.19 .08 .55 .3 .08 .4 .6 .18 .3 .22
And the wild cat - a - ract leaps in glor - y. / .85 /

.35 .72 .2 .72 .27 .62 .25 .7
O hark, / .2 / O hear! / .38 / how thin and clear, / .32 /

.2 .4 .2 .58 .23 .42 .18 .42 .26
And thin - er, / .2 / clear - er, / .3 / farth - er go - ing! / .55 /

.26 .68 .26 .7 .3 .4 .2 .6
O sweet and far / .12 / from cliff and scar / .62 /

.2 .7 .2 .46 .7 .6 .15 .5 .28
The horns of Elf - land / .3 / faint - ly blow - ing! / .84 /

.45 .4 .4 .7 .2 .4 .55 .7
O love / .3 / they die / .12 / in yon rich sky, / .7 /

.35 .6 .2 .65 .2 .72 .28 .3 .2
They faint / .25 / on hill / .15 / or field or riv - er;¹ / .9 /

¹ Doubtful division.

.4 .32 .35 .92 .42 .65 .18 .75
Our ech-oes roll from soul to soul, / .5/

.26 .78 .52 .3 .22 .4 .4 .2 .25
And grow for-ev¹-er / .18/ and for-ev-er. / 1./

In this selection the average length of the short syllable is .28; of the long, .53. The syllables range in length from .08 to .92. The lengths of the feet are given below. The numbers in parenthesis are the lengths of the syllables which are feminine endings.

.73	1. / .2/	.68	.96	/ .5/
.56	.53	.7 / .5/	.7 (.28)	/ .8/
.72	1. / .18/	.59	.58	/ .52/
.27	.85	1.08	.48 (.22)	/ .85/
1.07/ .2/	.92/ .38/	.89	.95	/ .32/
.6	.78/ .2/	.65/ .3/	.6 (.26)	/ .55/
.94	.96/ .12/	.7	.8	/ .62/
.9	.66	1.3 / .3/	.65 (.28)	/ .84/
.85/ .3/	1.1 / .12/	.6	1.25	/ .7/
.95/ .25/	.85/ .15/	.92	.58 2.2)	/ .9/
.72	1.27	1.07	.93	/ .5/
1.04	.82	.62/ .18/	.6 (.25)	/ .1/
<hr/>				
Average ....	.78	.88	.82	.72

Average for all feet, .8.

The average length of the foot in this selection is .8. There is a range in length from .27 to 1.3. From these results it is clear that there is as great a variety in the length of the feet as for the selections already given. Only very rarely does the addition of the pause to the foot make the foot equal in time to the other feet in the same line. Such an addition usually renders the time still more irregular.

The next selection considered is in a prevailingly anapaestic metre; it consists of two stanzas from Tennyson's *Break, Break, Break*. Since different readers might differ in the matter of foot division, I will indicate, from this point on, my division.

¹ Doubtful division.

Reader K

.5 .5 .6
Break, / .6/ break, / .28/ break, / .3/

.35 .3 .6 .5 .7 .3 .55
On thy cold / grey stones, / .15/ O Sea! / .65/

.2 .2 .4 .2 .25 .4 .18 .18 .3
And I would / that my tongue / could ut - / ter / .35/

.2 .5 .3 .2 .4 .3 .5
The thoughts / that a¹ - rise / in me. / .8/

.6 .6 .2 .2 .22 .15 .45 .6
O, well / for the fish - / er - man's boy / .55/

.2 .18 .55 .25 .2 .35 .18 .2 .6
That he shouts / with his sis - / ter at play! / .65/

.55 .6 .25 .3 .55 .2 .5
O, / .3/ well² / for the sail¹ - or lad / .45/

.18 .18 .55 .25 .2 .45 .15 .15 .6
That he sings / in his boat / on the bay.

In this selection the syllables range in length from .15 to .75. The averages for the two short and the long which make up the feet are .22, .27, .5.

Results for Break, break, break.

.5	/ .6/	.5	/ .28/	.6	/ .3/
1.25		1.2	/ .15/	.85	/ .65/
.8		.85		.36 (.3)	/ .35/
.7		.9		.8	/ .8/
1.2		.62		1.2	/ .55/
.93		.8		.98	/ .65/
1.15	/ .3/	1.1		.7	/ .45/
.91		.9		.9	
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
.93		.86		.8	

Average, .86.

¹ Doubtful division.

² First foot ends with well.

The feet range in length from .5 to 1.25, with .86 the average length. In this selection if the pauses are added to the times of the first three feet, these will be nearer the length of the feet in the second line; but in the whole poem there is great variety in the length of the feet. Probably the pauses in the first line do serve to establish for the ear a momentary sense of equality, but this equality is not maintained throughout.

A second reading of the first stanza by I gave the following results:

.67	/.38/	.62	/.4/	.65	/.58/
1.1		1.2		.9	/.7/
.85		1.15		.75	/.05/
.8		.95		.65	
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
.86		.98		.74	

In this second reading the feet range from .62 to 1.2. Again the addition of the pauses in the first line tends to make the time for that line more nearly equal to that of the second line. After the second line the feet are not regular; and the time of the last foot is similar to that of the first three feet without the pause. For this reader also the average length of the foot is .86.

The following selection taken from Arnold's *Forsaken Mer- man* is also an anapaestic verse form in which light syllables have been omitted.

Reader A

.72 .8 .7
Down, /.28/ down, /.25/ down! /.7/
.5 .08 .12 .5 .25 .12 .62
Down / to the depths / of the sea! /.6/
.25 .32 .2 .2 .52 .12 .08 .32 .28 .7
She sits / at her wheel / in the hum - / ming town, /.4/
.48 .2 .32 .48 .3 .25
Sing - / ing most joy - / ful - ly. /.72/
.54 .2 .2 .6 .34 .75 .36
Hark / what she sings: /.32/ "O joy, /.14/ O
.74
joy, /.52/

.2 .08 .34 .12 .46 .18 .14 .4 .12 .22
For the hum - / ming street, / .32/ and the child / with its

.6
toy! / .7/

.2 .1 .6 .12 .08 .65 .18 .12 .4 .2
For the priest, / .15/ and the bell, / .22/ and the ho / ly

well,
.6

.22 .1 .4 .2 .2 .7
For the wheel / where I spun, / .5/

.12 .15 .4 .2 .7 .18 .12 .7
And the bless - / ed light / of the sun!

The syllables range in length from .08 to .75. The general averages for the two short and the long syllables in all feet are .16, .22, .57.

The results for the feet are:

		.72	/ .28/	.8	/ .25/	.7	/ .7/
		.5		.7		.99	/ .6/
.57		.92		.52		.98	/ .4/
		.48		1.		.55	/ .72/
.54		1.	/ .32/	1.09	/ .14/	1.1	/ .52/
.62		.58	/ .32/	.72		.94	/ .7/
.9	/ .15/	.85	/ .22/	.7		.8	/ .4/
				.72		1.1	/ .5/
		.67		.9		1.	
<hr/>		<hr/>		<hr/>		<hr/>	
.66		.65		.79		.9	

Average, .72.

In this verse, as read by A, it will be seen that if the pauses are added to the feet in the first line, the feet will all be much longer than those in the second line. Moreover, the feet in the other lines vary greatly. The second foot in the fourth line is approximately twice as long as the others in the same line. The feet range in length from .48 to 1.1. The average length is .72.

To illustrate further the point that pause equalizes time-intervals, Omond gives Shelley's *Cloud*. This is written in anapaestic metre with iambic substitutions, at times with monosyllabic substitutions. Omond says that these units are all equal-

ized, not by the number of syllables which they contain, but by the fact that the time of the units is approximately equal, and rendered so by pause. I give the first stanza with times of pauses inserted, as before, between double lines; these and the single lines indicate, as before, the foot division.

Reader Ka

.25 .35 .15 .8 .15 .15 .3 .2
I bring / fresh showers / .15/ for the thirst - / ing
.6
flowers, / .2/
.2 .18 .42 .15 .15 .62
From the seas / and the streams; / .75/
.2 .35 .3 .5 .18 .18 .34 .4 .45
I bear / light shade / for the leaves / when laid
.18 .2 .22 .2 .7
In their noon - / day dreams. / .6/
.25 .35 .44 .22 .3 .2 .1 .6 .2 .25 .25
From my wings / are shak - / en the dews / that wak - / en
.1 .35 .53 .2 .21 .5
The sweet buds / .15/ eve - ry one, / .55/
.18 .47 .2 .4 .18 .2 .22 .18
When rocked / to rest / .2/ on their moth - / er's
.47
breast, / .4/
.2 .2 .45 .2 .1 .25 .2 .5
As she danc - / es a - bout / the sun. / .85/
.22 .22 .1 .5 .15 .15 .25 .15 .45
I wield / the flail / of the lash - / ing hail, / .3/
.2 .22 .18 .1 .32 .5 .2 .2
And whit - / en the green / plains¹ un - / der, / .5/
.22 .38 .1 .55 .15 .2 .7 .15 .55
And then / a - gain / I dis - solve / in rain, / .07/
.2 .4 .15 .18 .39 .18 .22 .25
And laugh / .2/ as I pass / in thun - / der.

¹ A more natural division of this line would be,
And whiten/ the green plains/ under/

Results for The Cloud.

(In order to indicate the length of the iambic and anapaestic feet I have marked these i and a respectively.)

.6 (i)	.95(i)	/.15/	.6 (a)	.8 (i)	/.2/
			.8 (a)	.92(a)	/.75/
.55(i)	.8 (i)		.7 (a)	.85(i)	
			.6 (a)	.9 (i)	/.6/
1.04(a)	.52(i)		.9 (a)	.45(i)	(.25)
			.98(a)	/.15/	.91(a)
.65(i)	.6 (i)	/.2/	.6 (a)	.65(i)	/.55/
	.85(a)		.55(a)	.7 (i)	/.4/
.44(i)	.6 (i)		.55(a)	.6 (i)	/.85/
	.42(i)		.6 (a)	.7 ¹	/.3/
.6 (i)	.65(i)		1.05(a)	.7 (i)	(.2)
	.6 (i)	/.2/	.72(a)	.4 (i)	/.5/
					/.07/
<hr/>			<hr/>		
.65	.67		.72	.71	
Average, .69.					

The syllables vary in length from .1 to .8. The average length of the short and long syllables in the feet is .2, .23, .41.

Some of the lines in this selection have feet which are approximately of equal length, such as those of the seventh and ninth lines; but there are other lines which contain feet not at all equal in time. In the fifth line the first foot is twice as long as the second. The feet range in length from .42 to 1.05 seconds, with .69 the average length. Anapaestic feet are at times shorter than iambic.

Another example cited by Omond as proof that time, not syllables, is the foundation of English metre is *Sing a Song of Sixpence*. The results for this are given below.

Reader I

.4 .15 .6 .1 .2 .3
 Sing a / song of / six - pence, /
 .1 .4 .18 .38 .15 .4
 A / pock - et / full of / rye, / .4 /
 .4 .2 .2 .15 .4 .42
 Four and / twen - ty / black - birds / .1 /

¹ From the point of view of quantity this foot is a trochee.

.4 .11.11 .5
Baked / in a / pie. / .52/
.28 .18 .4 .2 .22 .3
When the / pie was / o - pened / / .1/
.18 .4 .18 .25.08 .5
The / birds be - / gan to / sing, / .4/
.3 .22 .18.08 .3 .15 .34
Was not / that a / dain - ty / dish¹
.18 .22.18 .3 .1 .5
To / set be - / fore the / king? / .4/
.18 .38 .18 .18.08 .38 .38
The / maid was / in the / gar - den / .3/
.25 .18 .25.18 .45
Hang - ing / out the / clothes, / .55/
.4 .25 .08 .38 .32
Down / came a / black - bird / .1/
.1 .45 .18.18 .4
And / snipped / off her / nose.

Results for Sing a Song of Sixpence:

	.55	.7	.5	
(.1)	.58	.53	.4	/ .4/
	.6	.35	.82	/ .1/
	.4	.22	.5	/ .52/
	.46	.6	.52	/ .1/
(.18)	.58	.33	.5	/ .4/
	.52	.26	.45	.34
(.18)	.4	.4	.5	/ .4/
(.18)	.56	.26	.76	/ .3/
	.43	.43	.45	/ .55/
	.4	.33	.7	/ .1/
(.1)	.45	.36	.4	
<hr/>				
(.14)	.49	.4	.54	.34
<hr/>				
Average, .45.				

¹This line is given differently in different editions. In the form "Wasn't that a dainty dish," it is uniform with the other lines in the number of feet.

The feet range in length from .22 to .82, with an average length of .44. The time values are more nearly equal without the pauses; and the extra light syllables in the first column in parenthesis which, according to the theory advanced by many critics of verse forms, should when added to the last foot of the preceding line equalize the time, actually does so occasionally, but does not do this consistently; and there are in addition to these extra light syllables the pauses at the end of the line which plainly take no part in the formation of the metre. On the whole the time values are more nearly equal in this poem than in any selection studied.

The syllables range in length from .08 to .5. The average length of long and short syllables is respectively .35, .2.

I give finally a short selection from Browning's *Cavalier Tunes* as an example of the length of the dactylic foot.

Reader Ka

.4 .32 .46 .8 .5 .18 .16 .8
Kent-ish Sir / Bing /.2/ stood for the / king, /.6/
.26 .2 .12 .45 .3 .2 .4 .1 .35
Bid-ding the / crop-head-ed / par-lia-ment /
.72
swing; /.6/
.2 .38 .12 .1 .55 .18 .26 .12 .2
And, / press-ing a / troop /.2/ un¹- / ab-le to /
.58
stoop, /.5/
.22 .35 .15 .5 .6 .2 .26 .45 .18
And / see the rogues / flour-ish /.2/ and² / hon-est
.35 .48
folk / droop; /.75/
.52 .22 .12 .8 .35 .25 .5 .7
Marched then a- / long /.14/ fif-ty-score / strong /.7/
.35 .3 .2 .3 .12 .3 .44 .25 .28
Great-heart-ed / gent-le-men, /.45/ sing-ing this /
.68
song. /.9/

¹ Division doubtful.

² Foot ends with and.

.6 .46 .5 .8 .38 .26 .3
 God for King / Charles! / .5/ Pym and such /

.85
 carles / .42/

.18 .18 .35 .25 .42 .5 .38 .2 .38 .1
 To the / Dev - il that / prompts them their / treas - on -

.32 .75
 ous parles! / .55/

.35 .15 .5 .5 .6 .3 .12 .4
 Cav - a - liers, / .4/ up! / .4/ Lips from the / cup.

Results for Kentish Sir Bing.

	1.18		.8	/ .2/	.84	.8	/ .6/
	.58		.95		.85	.72	/ .6/
(.2)	.6		.73	/ .2/	.58	.58	/ .5/
(.22)	1.		1.06	/ .2/	.98	.48	/ .75/
	.86		.8	/ .14/	1.1	.7	/ .7/
	.85		.72	/ .45/	.97	.68	/ .9/
	1.56		.8	/ .5/	.94	.85	/ .42/
(.36)	1.02		1.18		.8	.75	/ .55/
	1.	/ .4/	.5	/ .4/	1.02	.4	
<hr/>		<hr/>		<hr/>		<hr/>	
	.96		.84		.90	.66	

Average, .84.

In this dactylic measure the feet range in length from .4 to 1.56, with an average of .84. In these lines if the pauses are added to supply the time of the missing syllables, no greater equality of time is found to result; the times of the feet in this selection, as in the others, are greatly varied; but here, also, certain lines are made up of feet approximately equal in time. In this selection, the pauses which occur within the line stand, at times, in the position of omitted syllables; at other times no syllables are omitted, as in lines four and six. The addition of pauses to the feet that have omitted syllables in no way consistently equalizes the time among the feet. To add the pause renders a particular foot, occasionally, more nearly equal to one standing near to it; but to add the pause usually makes the foot less like the others in length.

TABLE XI

The results for all selections studied are given in the following table:

Selection.	Metre.	Average Length of the Foot.	Range in Length.
Paradise Lost	iambic .....	.65	.18-1.25
Bugle Song	iambic .....	.8	.27-1.3
Break, Break, Break.....	anapaestic .....	.86	.5 -1.25
Break, Break, Break.....	anapaestic .....	.86	.62-1.2
Forsaken Merman	anapaestic .....	.72	.48-1.1
The Cloud	anapaestic-iambic ...	.69	.4 -1.05
Sing a Song of Sixpence..	trochaic.....	.45	.22- .82
Cavalier Tunes	dactylic .....	.84	.4 -1.56

The table indicates that the shortest average length is for the trochaic foot, .45; and the longest average is for the two readings of Break, Break, Break, .86. The average for all selections studied is .74.¹ For the purpose of the study of compensating pause, the ranges given are the most significant figures. When it is possible for a foot in a given poem to be five times as long as another in the same poem, and when one foot may frequently be twice as long as another, it is obvious that the theory of equality of time cannot be maintained, and that the omission of light syllables is not compensated for by pauses; whether pauses are interpreted as breaks after words or rests on words, the conclusion is the same. Fundamentally, within certain limits, no necessity for a consistent equality of time is required by the ear either for metrical or logical sound-units. The frequent repetition of approximately equal units establishes a rhythm, which, under the influence of thought and feeling, may be varied to a considerable degree. In this particular, poetry differs from non-rhythmic prose on the one hand, in that non-rhythmic prose has no units, metrical or phrasal, which approximate an equality of time; and it differs from music, on the other, which has time-units characterized by a comparatively precise equality. Certain poems approach prose in the faintness of their rhythmic character; certain others approach music in their strict adherence to a definitely marked scheme. Routine scansion and the measured reading, such as that said to have been employed by Tennyson, would serve to bring all poetry nearer music; but

¹ The average length of stressed and unstressed syllables in the different selections studied may be of interest and is therefore given in

most of us feel that neither poetry nor music needs to borrow to any extent the methods of the other; each is amply able to give pleasure in its own peculiar way.

the following table. The syllables in feet usually regarded as spondees are excluded from the results.

Syllabic Quantity of Different Metres

Selection.	Reader.	Average Length of Unstressed Syllable.	Average Length of Stressed Syllable.	Range for all Syllables
Iambic				
Paradise Lost.....	K	.26	.47	.15-.84
Paradise Lost.....	I	.28	.53	.08-.68
Paradise Lost.....	M	.23	.35	.1-.8
Bugle Song	Ka	.28	.53	.15-.75
Anapaestic.				
Break, Break, Break.....	K	.22	.27	.15-.75
Break, Break, Break.....	I	.23	.25	.15-.75
Forsaken Merman	A	.16	.22	.08-.75
The Cloud	Ka	.2	.23	.1-.8
Trochaic.				
Sing a Song of Sixpence..	I	.2	.35	.08-.5
Dactylic.				
Cavalier Tunes	Ka	.27	.33	.1-.85
Average for all metres..		.23	.26	.48
Range .....				.08-.85

The average length of all short syllables is .23; of all long ones .48, giving the ratio of 2:4.

SUMMARY OF RESULTS

I. Pauses mark off groups of words bound together in meaning. Certain groups are spoken by all readers as units; certain others may be spoken as units or may be broken up into smaller units. These smaller units are, however, in themselves logically complete divisions of thought. Certain conditions connected with the arrangement of words and phrases tend to produce pauses for some readers. Pauses are likely to occur after the inverted parts of a sentence, after emphatic particles, after phrases inserted between the parts of a sentence logically belonging together, after compound elements, and after other generally recognized grammatical groups. Pauses are more likely to be omitted after very short elements.

II. Logical points of division are usually indicated by punctuation marks, but punctuation and pauses do not always coincide. The readers of the *Paradise Lost* omitted on an average 8% of all punctuation marks, and made 18% more pauses than there are punctuation marks. In twenty-four lines of the *Paradise Lost* read by three readers with all punctuation marks omitted, the length of the pause and the total number made was approximately the same as for the punctuated material, but there were for each reader ten variations in the actual placing of the pause. It was found that for each reader 5% of words punctuated in the Masson edition and paused in the first reading were omitted in the second reading. To this extent only did the removal of punctuation marks affect pauses. The pauses omitted in the second reading were usually after shorter elements. The manner of punctuation may affect the pausing to some degree and consequently affects the larger rhythm made by sound-units.

III. Other causes aside from purely logical ones that may produce pauses at logically possible points of division are change of metre, a slow rate of speaking, rhythm, and rime. Among causes of this nature rhythm is probably the most important. A phrase rhythm once established in the mind undoubtedly will produce pauses at points where they would not occur in non-rhythmical discourse. The rhythm of the line also, once estab-

lished, may produce a pause at the end of a line when a pause is possible. Variations among readers in the placing of pauses seem to depend to some extent upon whether readers respond more sensitively to the phrase or to the line rhythm.

IV. The number of internal pauses in the blank verse studied is one-third greater than the number of end-pauses. Of the total number of lines studied 70% had pauses at the end; only 30% are therefore run-on lines,—a number considerably lower than estimates usually given. About 93% of the lines have one or more pauses within.

V. Approximately one-half of all pauses made within the line were made by all five readers alike. Two-thirds were made by all four readers alike. Approximately three-fifths of all the pauses made at the end of the line were made by all five readers in common, and three-fourths were made alike by four readers. Readers were more uniform, therefore, in placing the end-pause than in placing the internal pause. For all readers the pause occurs most frequently after the fourth and sixth syllables. Approximately one-half of all the internal pauses made occur at these points.

VI. The average length of all pauses is .45 of a second. The average length of the internal pause is .43, with a range for the averages of different readers from .27 to .65. The average length of the end-pause is .46, with a range in averages for different readers from .28 to .65. In lyric verse the end-pause was found to be twice as long as the internal pause; in this way the line in lyric verse is made more important than the phrase, and is further emphasized by the rime. The shortest pause taken as a rest pause was .06 and the longest pause was 1.3 seconds. Readers vary greatly in the length of the pause made at any given point in the material. This variation is not always due to a reader's habitual rate of reading; a slow reader may have short pauses, and a fast reader may have long pauses. Nevertheless the length of pauses in general for a given reader depends upon his rate of reading.

All readers of the *Paradise Lost* greatly varied the length of their pauses at different points in the material. A record made of a selection from Shakespeare's early blank verse showed no such variety in the length of the pause.

VII. Of the sound phenomena connected with pause, the very frequent increase in the length of the word or syllable preceding the pause is the most obvious. This increased length of the word is also found at points where some readers pause but with no pause occurring for other readers. For the latter the length of the word seems to take the place of the pause in the consciousness of the reader. Increased intensity at any given point cannot be accurately determined, but it probably occurs with increased length before the pause. Fall in pitch almost always is evident before a pause or before a place where one might occur; it may, also, serve to mark off sound-units.

VIII. The average number of syllables which constitute a sound-unit is 6.3. The average time of the sound-unit is 1.90 seconds, with a range from .42 to 5.3 seconds. The four-, six-, eight-, and ten-syllabled groups occur most frequently in the blank verse studied. The shorter groups are spoken relatively slower than the longer ones; and the longer ones are spoken relatively faster; but there is a wide difference in time shown in speaking groups made up of the same number of syllables and spoken by the same reader. This difference is undoubtedly due to both the phonetic character of the syllables and to the character of the thought conveyed.

The length of the sound-units is not beyond that established by most psychologists as capable of being rhythmized.

The shortest pauses occur usually after the shortest units; the longest occur usually after, not the longest groups, but after the most frequently occurring groups, thus serving to make these phrases more dominating factors in the phrasal rhythm.

IX. In the construction of metrical units, or feet, pause may take the place of omitted light syllables; but pause does not consistently make up the time of omitted syllables and cannot therefore be a compensating element. This statement is true whether the pause be regarded as resting on a syllable or following it. The measurement of syllables of various sorts establishes the fact that they are very unequal in length; consequently the feet which they compose are very unequal,—an inequality not made up for by pause. The pause that takes the place of omitted syllables undoubtedly enters into the composition of the foot, but it functions like a light syllable and does not, as the light

syllable does not, equalize time perfectly. All that the ear requires is an alternation of sounds varying in value and falling within the time limits essential for the perception of rhythm.

It is a pleasure to acknowledge my indebtedness to the students and members of the faculty of the University of Michigan who generously gave their time to read for me into the recording instrument. Especially am I indebted to Professor John F. Shepard for careful reading of the manuscript and for many helpful suggestions, and to Professor C. L. Meader for supervision of my work and for helpfulness in the solving of many difficulties which the problem involved. To Professor F. N. Scott, to whom I owe the suggestion of the subject, I am peculiarly indebted for discerning and sympathetic criticism.

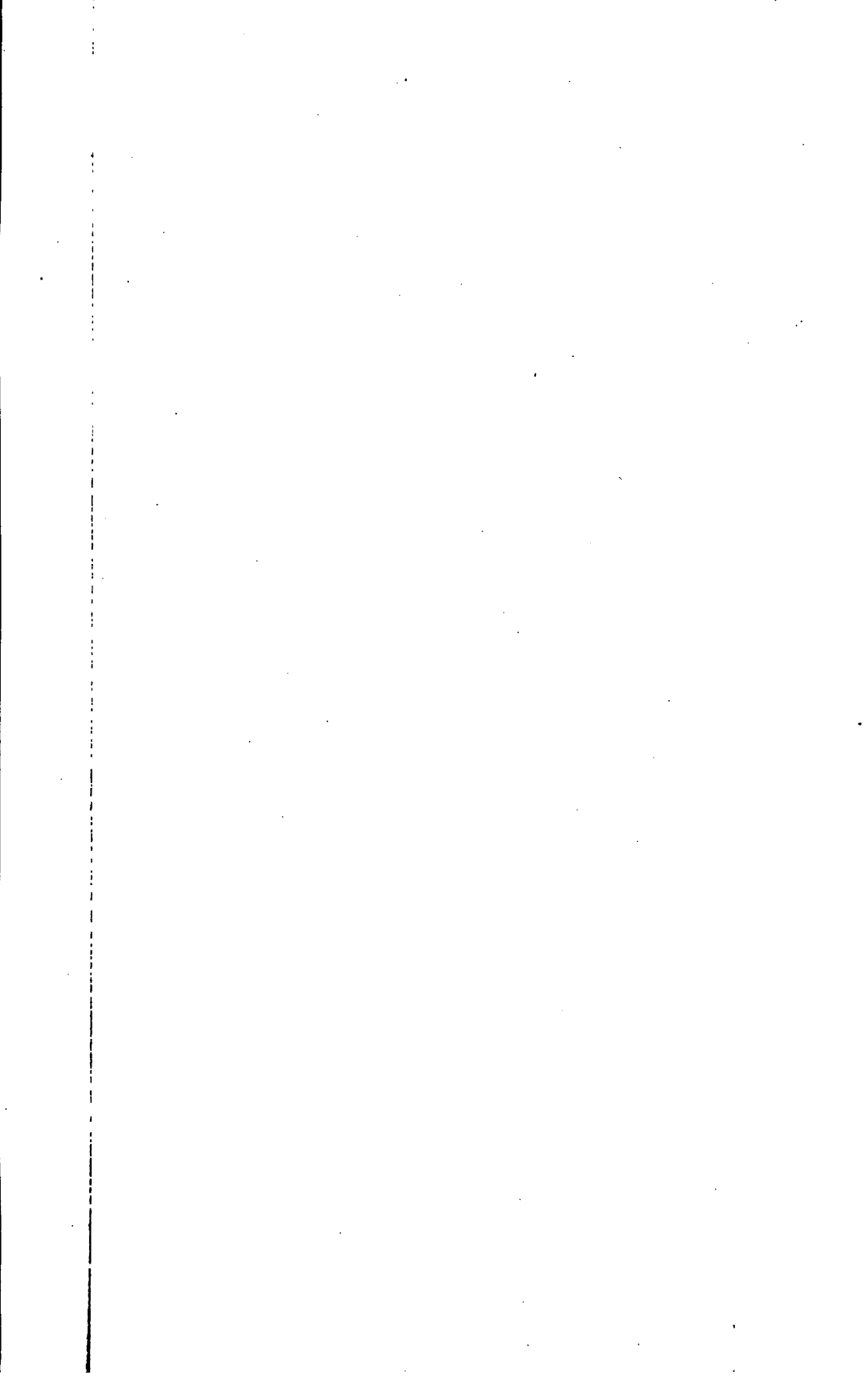
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